

V. *Remarks concerning fastitious Salts; drawn from a Discourse written by Sen. Francisco Redi.*

THE Happy Genius of the Cardinal *de Medici* favouring and promoting Mathematical and Philosophical Studies, as well as others, makes him among his most weighty Affairs, not pass by such things as may serve the Virtuoso's as well for Private as Publick Advantage, hence it is that Seignior *Francis Redi* has been induced to collect divers Writings and Observations made some Years past in *Florence*, about Vegetable Salts; which being not ready to be published, you will here receive an Extract of them, for the Satisfaction of the Curious, and the Improvement of Natural Knowledge, being hereby conducted into the Manner of extracting the Salts, their Quantity and Different Figures, as likewise their Virtue and Purging Quality.

Preparation and Circumstances.

1. Burn any sort of Herb, Flower, Fruit, Wood, or whatever it be, and make Ashes thereof, with the Ashes and with pure Water in its natural Temper make the Lye, which after straine through moist Paper or a Filtré, so that it becomes as clear as possible. Afterward put the Lye into a Glass Vessel, and let it remain in *Balneo Mariæ* until such time as a great part of it evaporates, according to the Proportion observed by those that are used to such Operations, and according as the Congelation of the Salt is desired to be more or less expedited or retarded.

2. If you keep the Lye to evaporate by the Fire in Vessels of Earth Glazed, you will lose a great Quantity of the Salts, for that as the Lye grows thicker, the Salt penetrates the Bottom and Sides of the Vessel of Earth, and is lost.

3. The Quantity of Water to make the Lye of is not determined ; for the most part 5th of Water will extract all the Salt from 2th of Ashes.

4. The Ashes whereof we have already made the Lye, and by Consequence drawn out the Salt, may, if you burn the same again in a Brick Furnace, make you afterwards another new Lye, which usually yields some small Portion of Salt.

5. The Salts drawn in the manner aforesaid, when the Air is Moist use to melt, to obviate this Inconvenience, when you burn the Materials to reduce them to Ashes, 'tis requisite to use with them a due Quantity of Sulphur, and if it happen the Ashes should be made to your Hand, you may mingle them with Sulphur, and keep the same to the Fire till such time as it be burnt. By this Means the Salt will never come to run, but become more White and Christalline.

6. There is no General Rule concerning the Quantity of Sulphur to be put into the Materials you thus Burn ; you may nevertheless at a guess say, to a Hundred Pounds of Materials 4 or 5 $\frac{3}{4}$ of Sulphur are usually sufficient.

7. All the Salts have a peculiar and determined Figure, the which they always keep, altho' they are often resolved into Water, and afterward congealed.

8. If in One only Liquid you dissolve together Two or Three sorts of Salt of different Figure, when they congeal, they all assume their ancient and Proper Figure, and this not only happens in *Factitious*, but also in *Mineral* Salts. If in a Vessel full of Water you dissolve equal or unequal Quantities of Vitriol of *Cyprus*, Roch Allum, and

and of purified Nitre ; this Water will be all of an Azure Colour : But when the Water is evaporated, you' will see in the Vessel, that the Vitriol, the Allum and the Nitre have re-assum'd distinctly their first natural Figures, and that the Vitriol hath recovered its most compleat Azure Colour, leaving the Nitre and the Allum with their usual transparent Whiteness.

9. Altho' it be said before, Number 7. That all the Salts have a proper and particular Figure, yet notwithstanding all this, Seignior *Redi* hath observed, That some manner of Salts have Two, Three and Four sorts of Figure. Two sorts have been seen in the *Lettuce*, in the *Scorzoner*, in the *Musk Melon*, the *Scopa*, in the Roots of *Esula*, in the *Black Hellebore*, in *Endive*, in *Eye-bright*, in *Worm-wood*, in *Sorrel*, and in *Shoots of Vines* ; Three sorts in *Black Pepper*, and in *Incarinate Rose* ; Four sorts in the Roots of *White Hellebore*.

10. Besides the before-mentioned diversity of Figures which are found in Salts, I have observed, that among all Salts of whatsoever Figure, there are found some Cubical ; which, though they be never so often dissolved and congealed, appear still of a Cubical Figure, or inclining to it.

11. He knows not that it is a General Rule, that the different Parts of Herbs, Fruits, &c. make Diversity in the Figures of their Salts ; but he says particularly, That the Salt of the Leaves of *Lawrel* differ from that of the Wood, and that the Figure of the Salt of the Pulp of a *Gourd* differs from that of the Rind.

12. Many Salts of different Matter have the same Figure, or at least very like : The Salt of *Cucumber* hath a Figure like the Salt of *Eye-bright*, *Mechoacam*, *Scopa*, and *Lettuce* ; also the Salt of *Orange Flowers*, *Roses*, *Ginger*, *Endive*, *Colloquintida*, *Scorzonera-Root*, *White Hellebore-Roots* and *Liquorish* are like one another, *Cole-*

worts and *Rosemary-Flowers* give a Salt of one and the same Figure, as likewise do among themselves *Vine-Bran-ches*, *Sorrel*, *Black Pepper*, the Rind of *Pomgranates*, and the Roots of *Black Hellebore*.

13. To make the Bodies of the Salts when they congeal, rest distinct one from another (so as their Figures may be observed) and not be intangled and heaped together, 'tis necessary, he says, that very great Diligence be used in evaporating the Lye, for if that be wholly evaporated, or if too great a part thereof, the Salts make a confused Crust at the Bottom of the Vessel, if the Lyes are left too Weak, the Salts require a very long time to congeal in, 'tis Requisite therefore to use such a Diligence, which is not to be gained without long Practice. The Instruments for measuring the Weights of Liquids, may give a Rule, which if it be not General, will at least come very near it; the Lyes being reduced to a convenient Thickness, are put into little small Glasses closed with a Stopple, and kept in a dry shady Place, and you must expect by the Benefit of Time, that the Salts will congeal themselves into Christalline Stones, either in the Bottom or on the Sides of the Vessel.

14. Not all Herbs, nor Flowers, nor Fruits, nor Woods when they are burnt, render equally the same Quantity of Salt, but according to the Diversity of their Species, the Quantity of Salt which is drawn from their Ashes, is found different. The Seasons wherein the Plants are gathered make a great Diversity, as also does the Country, whether Montanous or Champaine, or Sea-Coast or Marshy or Moist.

15. All Matters burnt give not the same Quantity of Ashes, but there is great Diversity which you may see by the following Proofs, the great Part in the Year 1660. in the Time of the Most Serene Great Duke *Ferdinand II.* of Glorious Memory.

Pounds.

Pounds.	<i>Vegetables.</i>	<i>Ashes.</i>		<i>Salts.</i>		
		lb	ʒ	ʒ	lb	ʒ
100	Of dried Flowers of Oranges	4	06	00	00	05
800	Of Gourds new gathered which dried in the Oven were 36 lb	4	00	00	10	00
400	Red Onions (being 720) roasted, the Coals turn'd to 16 lb to the Coals new added 4 $\frac{3}{4}$ of Sulphur.	1	06	00	00	02
150	Eyebright fresh, and afterwards stilled and burnt	5	00	00	00	04
120	Distill'd Roses	4	00	01		
100	Of Maidenhair	9	00	00	00	04
150	Roots of Black Hellebore, which dried came to 50 lb	6	00	00	00	01
150	Roots of White Hellebore fresh, which dried came to 50 lb	2	00	00	00	04
96	Roots dried and burnt of fresh Esula	3	00	00	00	02
30	Roots of Liquorish	2	00	00	00	01
20	Pellitory	1	00	00	00	00
100	Green Endive	2	00	00	00	02
90	Green Bindweed	1	00	00	00	02
2000	Leaves of Lawrel	33	00	04	00	00
500	Leaves of Lawrel	6	00	00	00	10
1000	Water Mellons well ripe, the Seeds being taken	25	00	01	00	09
2400	Cucumbers	18	00	00	00	00
300	Wood of Ivy	9	00	00	00	00
50	Scorzonera dried	8	00	00	00	00
300	Pine Apples, the Nuts taken out	3	00	00	00	00
150	Mugwort dried	8	00	00	00	00
130	Leaves of <i>Cyprus</i>	6	00	00	00	00
10	Peele of Pomgranates dried		08	00	00	00
2	Sassafras		00	00	00	00
12	<i>Lignum Sanctum</i>	2	06	00	00	00
4	Yellow Sanders		01	04	00	00
4	Black Pepper		02	04	00	00
30	Ginger	1	07	00	00	00
12	Turbit	1	00	00	00	00
	Wood of Firr	3	00	00	00	03
	Scopæ	16	00	01	00	04
	Scopæ	16	00	01	00	06

Heads of Old Garlick 32 lb were dried in a Furnace and burnt, from the Ashes there was hardly any Salt to be gathered.

Thirty Pounds of Wheat-Flower burnt in a Furnace with a little Sulphur, and burnt a new in a Potter's Oven, give 8 3/4 of very black Ashes, the which being Baked again for Eight Days continually in a Brick Furnace, after the Lye was made, there could not be a Grain of Salt drawn. The like happen'd in 10 3/4 of Ashes drawn from a Stare and a half of Bran, burnt first in the Furnace with Sulphur, and afterwards baked in a Potter's Oven, and in one of Bricks.

16. All the Salts whatever drawn from the Ashes of Vegetables, taken by the Mouth, says he, have a Purging Faculty, and a great Measure more than what by some is believed in common Salt, which taken by the Mouth has little or none at all, or if it have any betwixt that of common Salt and Vegetables, the Proportion is but as Two to Eight.

17. This Solutive Faculty is of equal Energy in all the Salts in such Manner that the Salt of Sumack, Peeles of Pomgranates, Mirtle Berries, or Mastick Purges as much as the Salt of Rubarb, Sena Turbith, Mechoacan, and all other like purgative Drugs.

18. The Dose to be used is the same in all the Salts, to wit, from Two Drachms and an half to half an Ounce, dissolved in Six Ounces of common Water; and Broth he has observed by infinite Experiments, that half an Ounce uses to Purge Three Pounds and a half, or Four, or thereabouts, of Matter more or less, according to the Complexions, and according to the Fulness of the Bodies.

19. In Purging he has found no difference betwixt these Salts that have sharp Points, and those that are obtuse and blunt or cubical; he has made Proof very often in divers Persons, causing the like cubical Stones of Cucumbers

bers, Ginger, Colewort, and of Liquorish to be picked out, and he has seen that they have worked with the same Energy as the most acute Hexagone Stones of the Salt of Pepper, of Carnation Roses, of Mechoacan, of Coleworts, of Cucumbers, &c.

20. From the aforesaid Observations, tho' you cannot establish a certain Rule, you may nevertheless conjecture, not without some Reason, *First*, That the Salt drawn from the Ashes of Herbs, Flowers, and of Fruits, &c. do not conserve the Virtue, and that Faculty which Physicians believe the Herbs, Flowers, Fruits, &c. are endowed with. *Secondly*, You may very near be certain of the Proportion of Ashes rising from each Species of Vegetables, and of the Quantity of Salt which is afterward to be drawn from them; and it will not be ungrateful to the Reader that I put here the Differences by me computed (of the Ashes, after the rate of 100 Pounds of Vegetables, and of the Salts after the Rate of One Pound of Ashes) and depose according to the Order of the Excesses.

A Table of the Ashes which 100 lb give.

	lb	ʒ	ʒ	ʒ	gr.
Red Onions	00	04	04	00	00
Gourds	00	06	00	00	00
Cucumbers	00	09	00	00	00
Pine Nut-Shells	01	00	00	00	00
Yellow Sanders	01	00	04	00	00
Bindweeds	01	01	02	02	00
Laurel Leaves	01	02	00	00	00
Roots of White Hellebore	01	04	00	00	00
Other Leaves of Laurel	01	07	04	02	10
Endive	02	00	00	00	00
Wheat Flower	02	02	05	01	00
Water Melons	02	06	00	00	00

Ivy

	℥	ʒ	ʒ	ʒ	gr.
Ivy	03	00	00	00	00
Roots of Esula	03	01	04	00	00
Sassafras	03	01	04	00	00
Eyebright	03	04	00	00	00
Distill'd Roses	03	04	00	00	00
Roots of Black Hellebore	04	00	00	00	00
Orange Flowers	04	06	00	00	00
Leaves of Cyprus	04	07	03	05	00
Pellitory	05	00	00	00	00
Black Pepper	05	02	04	00	00
Ginger	05	03	02	02	00
Mugwort	05	04	00	00	00
Pomgranate Bark	06	08	00	00	00
Roots of Liquorish	06	08	00	00	00
Turbith	08	04	00	00	00
Maiden-Hair distill'd	09	00	00	00	00
Scorzonera	16	00	00	00	00
Lignum Sanctum	20	10	00	00	00

*A Table of the Salts which are extracted from
One Pound of Ashes.*

	℥	ʒ	ʒ	ʒ	gr.
Maiden-Hair	00	00	00	01	08
Roots of Black Hellebore	00	00	00	04	00
Orange Flowers	00	00	01	00	08
Lawrel Leas	00	00	03	01	22
Root of Esula					
Roots of Liquorish	00	00	06	00	00
Pellitory	00	00	06	00	00
Water Melons	00	00	06	01	11
Red Onions	00	00	07	01	00
Endive	00	01	00	00	00
Firr	00	01	00	00	00
Roots of White Hellebore	00	01	00	00	00

Scopæ

	lb	3	3	9	gr.
Scopæ	00	01	00	00	00
Another	00	01	01	00	00
Eye-bright	00	01	01	01	09
Other Leaves of Lawrel	00	01	05	01	06
Bindweed	00	02	00	00	00
Gourds	00	02	04	00	00
Rofes	00	03	00	00	00

In this Table you see some Variation in the same Species of Vegetables, the which do not give always the same Quantity of Ashes and Salt, and that which is considerable, some Vegetables, insipid and cold, as Endive, Pompion, and Rofes, have given much more Salt than others of a stronger Savour, aperitive, and incisive, as the Onions, Hellebore, Lawrel, Maiden-Hair, and the Garlick which is so strong, gives none at all: But it may perchance be said, that in these there is a greater Quantity of Volatile Salt.

VI. A Letter from Dr. Rob. Conny, to the late Dr. Rob. Plot, F. R. S. concerning a Shower of Fishes.

Since my last to you I have received an Account of the prodigious Rain you long ago desired of me, and this Opportunity offering of conveying it safely to you I wou'd no longer delay it, and had I received the Account as you promised me of that of the Herrings, I might possibly have said somewhat more, but I shall