

River *Oby* marks the place of a Cataract or Fall of waters. The letter *K* denotes the conjunction of *Zembla* with the Continent. The River marked *L*, runs toward *China*, called *Kitaie*: which is not every where navigable, by reason of the rocks and other inconveniences that obstruct the passing of vessels. *Weigats* it self is very difficult to pass, because of the great quantity of Ice, continually falling into it out of the river *Oby*, whereby that streight passage is stopp'd up. The *Samajeds* go every year a fishing upon the said sweet Sea and that on *Nova Zembla's* side *. * See the Fig. annexed.

A way of extracting a Volatil Salt and Spirit out of Vegetables ; intimated in Numb. 100. p. 7002 ; Experimented, and imparted by the Learned and Intelligent Dr. Daniel Coxe, Fellow of the R. Society.

TAKE, in warm weather, a considerable quantity of the Leaves of any Vegetable, stripp'd or pulled from the greater stalks ; lay it on a heap, pressing it pretty close together: They will soon become very hot, especially in the middle, and after a few days resolve into a pappy substance (excepting the outward leaves,) which being made into pellets, and put into a Glass-retort, and distilled, will yield, besides a great quantity of liquor, much thick black Oyl of a balsamick consistence. The liquor being separated from the Oyl, and distilled in a tall Glass-body, a *Volatil* Spirit sublimes, which, after one, two or three rectifications, becomes perfectly *Urinous*, not to be distinguish't, by smell or taste, from well-rectified Spirit of Harts-horn, Blood, Urine, or Sal Armoniac.

I never made tryal of any Herb, which, thus ordered, did not yield the mentioned substances ; although I have examin'd many by this method of procedure, which seem'd very different from each other as well in sensible qualities, as those vulgarly called occult ; such as Rue, Sage, both Celondines, Carduus benedictus, Tobacco, stinking Orach, garden Scurvygrass, the lesser Spurge, Baum, Mint, Tanfy, Camomil, Monks Rhubarb, several Docks, and even common Grass, with many others, which it were altogether unnecessary to enumerate ; besides Flowers of Elder, Pæony, Cowslips, Clove Gilliflowers, &c. with several sorts

sorts of Mosses, and Rudiments of Vegetation ; which last is a green substance on the surface of the earth, in rivers, cisterns, where rain often falls, and on ships between wind and water, very apt to run into moss and fibres.

Note, 1. The Vessels, wherein these Distillations were performed, though exceedingly well washed with water, scowred with common salt, sand, ashes, soap, fixt salts, &c. and afterwards exposed many years unto the Air, wind, rain, dews and frosts, yet nevertheless retain'd a very strong smell, not much unlike that of *Musc.*

2. The water left at the bottom of the glass, after the first rectification, was somewhat acetous ; especially when the herbs were not sufficiently fermented.

3. If the Herbs are duly fermented, they leave little *Caput mortuum*, sometimes not a twentieth, and never, by my trials, above a tenth part ; whereas distilled *before* fermentation they leave much more : And this remaining coal, burnt to ashes, yields scarce any Alkali or fixt Salt.

4. The Volatil Salt is much more than the Fixt Salt would have been, afforded by the herb incinerated the ordinary way.

5. All those Herbs which yield store of fix'd Salt (such as Wormwood, Carduus, Mugwort, Sage, &c.) do likewise, being thus managed, afford plentifully a Volatil Salt.

6. These Volatil Salts being highly rectified, did not, that I could perceive, differ from each other ; as neither do Vinous Spirits of fermented Vegetables, or their Fixed Salts highly purified and rectified.

7. During the Fermentation, the room would be strongly perfumed *at the beginning* with the natural scent of the Herb, if it had any eminently peculiar smell ; *in the middle*, with the scent of a mixt between that and the Urinous : But being well putrified, became sensible Urinous.

8. The distilled liquor of some herbs, at the first rectification, yielded a Spirit very hot ; but the last inclined rather to that of pungent vinous spirits of Scurvygrass, Horse-radish, being, if I may so speak, piperaceous and biting, rather than like Volatil Salts ; but after repeated rectifications, one, two, or more, according to the nature of the plant, or time it had fermented, became perfectly Urinous. This was usually, when
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the Herbs had not duly fermented ; which proceeded, in my apprehension, from some commixture of Essential oyl, which by reiterated rectifications is either separated or transmuted. The same happens in the Vinous spirits of fermented Vegetables, and in their fixed Salts.

9. In the Distillation of the putrified herbs, the Urinous Spirits and salt came chiefly at the latter end with the Oyl, in the form of a thick white cloud or fumes, and condensing in the Receiver, formed an innumerable company of very irregular crooked rivolets, exactly after the manner of Harts-horn, Blood, &c; and at the beginning came the Phlegme with most of the *Acetum* in great drops with little fume, and the rivolets strait, and without *striae* and wandrings.

10. Some herbs, as Winter-savory, Sage, &c. in the first distillation yielded copiously a Volatil Salt in a dry form, which did coat the Receiver, and sublimed into the neck of the Retort: So doth Tobacco ; and *once* Saffron did so, in digestion with spirit of wine.

11. All plants, thus fermented, yielded plentifully (especially toward the latter end of the distillation,) a fatid gross oyl, which, if the herb was well putrified, did not in the least resemble the plant which produced it ; and I could hardly perceive, that they differ'd from each other in either taste or smell: only, if the plant was not thoroughly fermented, an Oyl would come over at the beginning of the distillation, which, as also the water, would retain exactly the taste and smell of the vegetable, which afforded it ; and it would be fluid and transparent, like other Essential oyls. The Oyl of herbs very well putrified came over chiefly *at last*, and did require a very strong fire to extricate it out of the herb; was mostly, especially that which comes last of all, of the colour and consistence of Tar, very tenacious, and did far and wide emit a very odd, faint, fetid, offensive odour: If any thing became infected by this oyl, it was not to be freed from it in a long time.

12. Herbs, which, distilled in an A'embic with water, yield little Essential oyl, as Baume, Mint, Camomil, &c, afford much of it, thus fermented: And those, that give much Essential oyl, as Wormwood with many others, being putrified, yield abundantly more.

13. During

13. During putrefaction, the herbs became exceedingly hot, especially those that were closely compressed and had store of moisture in them; so that I could as well detain my hand in the flame of an ordinary fire, as in the midst of them.

14. Fatty, moist, and insipid herbs, ferment much sooner, and with greater heat, as Grass, Docks, Garden Scurvy-grass, Celondine, &c: Drier and much more sapid plants, more leisurely, and with less heat, as Winter-savory, Rosemary, Sage, Rue, Mint. The Stalks of no herbs ferment so soon, as the Leaves freed from them. This is most evident in Docks, whose tender parts are pappy and mucilaginous, when the stalks are entire.

15. Herbs seem by this putrefaction to be deprived of all their specific or peculiar properties: Celondine looses its tinging quality; Spurge, its milk, vesicating and poisonous nature, &c.

16. Herbs, which *before* putrefaction were extremely fetid, as *Atriplex olida*, &c. became afterwards either inodorous, or not ill scented: And, on the contrary, Monks-Rhubarb, Garden-Scurvy-grass, with many other inodorous vegetables, *during* putrefaction became abominably and almost insupportably fetid, like the worst of Excrements; all which yet they lost immediately upon distillation.

17. None of those Flowers, I have hitherto used, do stink in fermentation.

18. Many of the herbs, thus putrified or fermented, swarm with *Maggots*, (an argument of the close and stedfast contexture of the Seminal principles in Plants,) especially at the bottom, and in the middle, whither Flies and other Insects can have no access to deposit their eggs, and where the heat is so violent, that they could not possibly subsist.

19. Yet the Volatil spirit and salt is not afforded by these Insects: For, having distilled separately a great quantity of them, they yielded no volatil salt or spirit, but a liquor of a very different nature.

20. Herbs fermented in a great Glass with a narrow neck, the mouth left open, in a few weeks became, for the greater part, a mucilage, and distilled a year after they had stood so open, yielded a little Urinous spirit, but not a drop of Oyl.

21. Vegetables, if the external Air be excluded from them, will not putrify or ferment.

22. Some

22. Some herbs, Mosses, and Rudiments of Vegetation, yield a Volatil Salt, distilled without previous fermentation; as do also many *Seeds*, and several of them sufficiently insipid.

23. These Volatil spirits and Salts have not only the same sensible properties; but also agree in all known effects and operations with common Urinous spirits and salts; as, in the changing Syrup of Violets and many other vegetable tinctures green; in being Diaphoretic, Diuretic, and De-obstruent: Contrary to *Acids*, which they do mortifie; præcipitate all metals and minerals dissolved in acid menstrooms; being highly rectified, and mixt with perfectly dephlegmed spirit of wine, strike the *offa alba*, as Chymists speak: They unite with Acids, and thereby become Armoniac, or Neutral Salts; and indeed perform whatsoever can be expected or desired from the common Urinous Spirits or Salts.

So far our generous Naturalist his Communications for this time; which as they are but a small part of the Analysis of Plants, and but *one* of the heads of the *History about Vegetables*, the care of which, divers years ago, the *R. Society* recommended to him; so we doubt not but he will in compliance with their desires, and the opinion they justly entertain of his known abilities, sedulously prosecute this excellent work, and farther, from time to time, impart to the Philosophical world that great stock, he hath already in store concerning this and many other subjects of Physiology. Mean time, we are obliged to do him that right, as to acquaint the Publick, that this way and these Experiments were made by him about *eight* years ago, and then most of them by conversation communicated to the Honourable *Robert Boyle*, who doubtless will be ready, upon occasion to attest it, as well as divers other Members of the *R. Society*, as will also the *Archiva* of that Illustrious Body.

An Obser-