



THE COMPLETE WORKS
OF

RUDOLPH
GLAUER

trans: Chris. Packe



PHILOSOPHICAL
FURNACES

THIRD PART

THE
THIRD PART
OF
PHILOSOPHICAL FURNACES:

In which is described the Nature of the Third Furnace; by the help whereof, and that without Stills, and Caldrons, and other Copper, Iron, Tin, and leaden Instruments, various Vegetable burning Spirits, Extracts, Oils, Saks, & etc. by the help of certain little Copper Instruments, and wooden Vessels are made for Chymical and Medicinal Uses.

A Preface of the Copper Instrument and Furnace.

Now this Instrument is made of strong Copper plates after the following manner. You must make two strong hemispheres of Copper or Latten of the bigness of a mans head (or thereabout) and join them together with a moat strong solder, and that without tin, whereof the one must have a pipe: Now the pipe must be of a most exact roundness, that it may most accurately fit the hole that is made with an auger or wimble to keep the water from flowing out like to a tap, of the length of one span at least, wider on the hinder part towards the globe, than on the forepart, which also must be according to the bigness of the globe, greater or lesser, and be exactly joined with the best solder to its hemisphere, and the diameter of the forepart being very round like a tap, and most exactly filling the round hole must be of two fingers

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breath. Now there is required to the foresaid Instrument or globe, a certain peculiar little furnace made of Iron or copper, viz, most strong copper plates, covered within with stones or the best lute, into which is put this globe like a retort, so that it may lye upon two iron bars of the distance of a span, or span and a half from the grate; the neck whereof (that pipe) goeth forth of the furnace one span at least. The furnace also must have below a place for the ashes, and above a cover with its hole for the letting forth of the smoke, and for regulating the fire, as you may see by the annexed figure. It must also below have a treefoot, on which the furnace must be set, and on the sides two handles by the help whereof it may be removed from place to place; the which is very necessary; for it is not only used for the distilling of burning spirits by wooden Vessels Instead of copper, but also for such distillation, and digestion that is performed in gourds, bolt-heads, and other instruments of glass, stone, copper, tin, & etc. which are to be set in Balneo: also in the boiling of beer, metheglin, wine, and other drinks, which are to be performed by the help of wooden Vessels.

Of Wooden Instruments that are to be used instead of Stills, Baths, and Cauldrons.

In the first Figure, A represents the Furnace with a Copper Globe. B. The Copper Globe. C. The distilling Vessel. D. The Refrigeratory with a Worm. E. The Receiver. F. Stools on which the Vessels stand. The Second, A. Balneum with a Cover having Holes in it for the Glasses,

set upon a Tree-foot. The Third, A Wooden Vessel for the making of Beer. The Fourth, A Pub for a making a moist bath, which is to be warmed by the Copper Globe. The Fifth, A wooden Box for a dry Bath to provoke sweat with Volatile Spirits.

In the first place I shall speak of wooden Vessels that are to be used instead of Copper stills, in the distilling of burning spirits out of wine, beer, lees, malt, wheat, meal, roots, herbs, flowers, seeds, and other vegetables, as also oils of vegetables.

See that thou hast an oaken barrel, like to those wherein wine and beer are kept, of a just bigness, viz. answerable to the bigness of the globe, as is sufficient for the coction: for a barrel that is too big will make the coction slow, and tedious. A greater globe may be fitted to a lesser barrel, but not on the contrary, a great barrel to a little globe: For by how much the bigger the globe is, and the lees the barrel, so much the sooner is the work hastened. Now seeing that this Art was invented for the saving of costs, which otherwise would have been expended in providing of stills, cauldrons, furnaces, & etc. it is best not to have too great a globe, which requires a greater furnace, and is more hardly to be carried, because it is to be covered within with lute, or a wall; for it is sufficient if it be big enough for the coction. Therefore I will give you a just and due proportion of both, viz. of the globe, and vessel, which in distillations and other operations, the curteous reader may Imitate.

A globe of the bigness of a mans head, containing three or four

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cannes, whereof each containeth four pints, is sufficient for the heating of a barrel of 30, 40, 50, 60, and 100 gallons, which by how much the more remote from 100 and nearer to 30, so much the sooner is it heated, and the coction furthered; and on the contrary, by how much the nearer it is to 100 and more remote from 30, so much the slower is the coction. I do not therefore advise that a huge barrel be chosen for a small globe, by reason of a long and tedious operation: And if all and every thing be not so accurately observed to a hair, yet it matters not much, because it sufficeth to do the same thing by the help of one small Copper instrument of divers forms. For in this way of distilling, wooden vessels that are requisite to the distilling of spirits, arid boiling of Beer, and so for baths are more easily provided, then so many Copper vessels in the common way. For by this means not only costs are spared, but also it is in stead of building of furnaces, because when any barrel hath been used, you may remove it, and set another in the place of it for another operation, the which cannot be done with stills and cauldrons fastened into a furnace. And this invention is for those that want Artificers, as Coppersmiths, & etc. because wooden instruments are more easily provided: also by the help of this globe may most secret operations be performed.

For the furnace with the copper globe may be built in one place, and in another place the BALNEUM, viz, the places divided with a wall, so that he that looks to the fire may not know what is thne in the Elaboratory; for oftentimes the care of the fire is committed to heedless servants, that break glass instruments by their carelessness, by which

means oftentimes a most precious medicine is lost; which danger this invention is without.

Wherefore this copper globe with its wooden vessels is more convenient then those copper stills and cauldrons. But this I would have thee know that this new invented distillation is slower, then the common way which is performed by stills, and consequently requires a long fire. I desire therefore the rich that dwell in large and spacious houses, that they would use the old way of distilling; but the poor, who have but little household conveniences, and the covetous, that they would use this little copper globe with Its wooden vessels: for although there be a longer fire required, yet these are not to be compared to those costs which are otherwise expended upon so many copper vessels of so many divers forms. Let him therefore keep to his copper vessels, who cannot understand me, for it concerns not me. Without doubt there are some whom this my new invented way of distilling will please, before other, being communicated for the sake of the poor labouring house-keepers, that cannot boil Beer, and distill burning spirits for lack of vessels: for a globe of five or four pound is more easily provided, then other copper vessels, of 60, 60, 100 pounds: also those wooden vessels are more easily provided then furnaces, which some for want of place only cannot build. Choose therefore which way thou wilt, for these things which I have wrote, I have wrote for the poors sake rather than for the rich. Certainly rich men that have spacious Elaboratories need not to be ashamed to follow this way, for it is free for every man to go a shorter way, unless they had rather prefer the old way before a

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new and compendious, whom I cannot help, being contented with a publication which is made for the sake of my neighbour, whether it be taken well or ill, with a good mind, certainly knowing that more profit then disprofit may be obtained by the help thereof. It shall not therefore repent him of his labour, who knows rightly to prepare and use this copper, and wooden vessels.

There follows now the preparation of the vessel.

The vessel being made is to be placed with one bottom, upon a stool that is fitted for it, which being done, make a hole with a wimble fleer the bottom, for the receiving of the neck of the copper globe, which is to be covered over with a linnen cloth: make also about the lower bottom another hole for a tap, by the help whereof the remainder of the distillation is drawn forth: also you must make a large hole in the upper bottom, the diameter whereof must be one span for to pour in the water to be distilled, with a funnel. Also there must be made a hole near the upper bottom of two or three fingers breadth, into which is to be put a copper pipe of a span long, which is to be fastened closely therein; and to this pipe another oaken vessel with a copper worm and cold water like to other refrigeratories, must be applyed. Also the joints of the aforesaid short pipe, viz, of the first barrel, and of the second barrel, viz, the refrigeratory must be straightly, and closely united together, which afterward may be the better joined together with a fit lute for the distilling. And this is the form and fashion of the

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wooden vessel, that is to be used in the place of copper vessels, in the distilling of burning spirits and oils. But thou wilt object that these kind of wooden vessels are porous, and drink up great part of the spirit and oils.

I answer; none of the spirits seeketh a violent passage out, in case the ways be open. There is no danger therefore, when there is passage enough given them by a pipe that is wide enough. Neither doth oil stick to them in distillation, for whatsoever is by force of the boiling water to be separated from the spices, and seeds that also is sublimable by the force of the seething water, so as to distil in, so that in the refrigeratory no more is lost than in the stills. Distillation being made, the aforesaid spirits may be rectified in these wooden vessels, (being first washed) as well as in copper stills.

The making of a wooden vessel for a Balneum, which is to be used in stead of copper and leaden Cauldruns for digestion, and distillation by glass vessels.

Make an oaken vessel as big as or as little as you please, according to the greatness, or littleness, multitude, or fewness of the vessels, of two or three spans high, a little narrower above then below, and so fashioned above, that a cover of wood, copper, or lead, may most closely be joined to it: the cover must have holes greater or lesser, according to the glasses, as is wont to be in the making of a BALNEUM, as you may see by the annexed figure. This vessel also must be placed

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upon a stool of the height of an eli, or such height as is required for the joining of the copper globe with the BALNEUM, which must have a hole near the lower bottom, for the receiving of the neck of the foresaid globe. In defect of such a vessel, which yet you may provide easily enough, take a wine or beer vessel divided in the middle, and make a hole near the bottom for the neck of the globe, make also a wooden cover with holes, & etc. He that will be curious may provide all things according to the best Art.

A wooden vessel serving for boiling of beer, setheglin, vinegar, & etc. as well as copper, iron, and tin vessels.

Make a wooden vessel, which shall be more high than broad, a little wider above than below, as you please: or take a wine or beer barrel divided in the middle, and near the bottom make a hole for the neck of the globe, which is to be covered with boards, which serves as well for the boiling of beer, & etc. as those of copper.

A wooden vessel for a bath for sweet, or mineral water, which may be according as you please, kept warm, for the preserving of health.

Make a long wooden tub convenient to sit in, which is to be set upon a stool of a just height, viz, that the bottom of the vessel may answer the neck of the globe which is put into the furnace: you may also have a cover, that may cover the whole tub, which may be divided

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and united in that place where the head goes forth, as appears by the annexed figure, or you may cover it with a cloth, laying it upon small crooked sticks fastened to the tub, yet so that the head may have its liberty, especially in a vaporous bath of common sweet, or medicinal water; or make a high wooden cover shutting very close, for a dry sweat, where it is no matter whether the head be shut in or no.

Of the use of wooden vessels in distilling, boiling, bathing, & etc. And, first of the distilling vessel.

He that will distil any burning spirit by help of the distilling vessel, out of wine, metheglin, beer, barley, wheat, meal, apples, pears, cherries, figs, & etc. also out of flowers seeds, and other vegetables, hath need so to prepare his materials, that they may yield their spirit. Where I thought it convenient, and indeed necessary to say something of the preparation of each vegetable, for better information sake, or else a profitable distillation is not to be expected, but labour in vain to be feared.

And first of the preparation of the lees of wine, beer, hydromel, and other drinks.

The lees of wine, beer, hydromel, & etc. have no need to be prepared, because they do easily enough of themselves yield their spirits, unless haply having lost all their humidity they be dried, which you may make

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moist again by the admixtion of common water, lest they be burnt in distilling & stick to the vessel; of which thing more in the distillation it self. Now flowers, roots, herbs, seeds, fruits, apples, pears, cannot be distilled without a foregoing preparation. You must therefore first prepare them as followeth.

Of the preparation of all kind of corn, as Wheat, Oats, Barley, & etc. which must go before the distilling of the spirit.

And first of all a malt must be made of the corn; as it is wont to be in the making of beer. Now the manner of making of malt is known almost to all, wherefore I need not speak much of that, because in all places that have no wine, there is scarce any house found in which Malt and Beer is not made, as well in the country as cities, But however, there is a great deal of difference of making of it, for a long knife doth not make a good Cook, nor all drinkers of wine are good planters. For many have perswaded themselves, that, if they follow the footsteps of their fathers, they have done well (although they have been in an error) and being scornful, refuse instruction. Wherefore something is to be said of the difference of malting. Although I never exercised the Art of making Beer, yet I am certain I do in that excel all other Distillers, and Brewers. For I often saw and indeed with admiration, the simplicity of many in their operations, although common, and daily, to whom though an age should be granted, yet they would never be more thrifty, being content with their ancient customs. Good God! How

perverse is the world, where no body labours to find out any good; neither is there any one that thinks of perfecting and amending things already found out: Where all things run to ruin, and all manner of vice increase: for now almost every one seeks only after riches BY RIGHT OR WRONG; for it is all one with them, if they have them, not thinking that things ill gotten shall perish, and that the third heir shall not enjoy them, and that unjust riches shall devour those that have been honestly gotten, with danger also of eternal damnation. I pray you, if our Ancestors had been so negligent, and had left nothing to us: I pray you, I say, what Arts and Sciences should we have had now? It is come to this pass now, that virtues decrease, and vices increase.

Of the difference of málting.

The difference of malt, by reason whereof it yields better or worse beer, and spirit, consists for the most part in the preparation thereof; for being made after the vulgar way it retains its taste, wherefore it cannot yield good spirit, nor good beer, which is observed of very few, wherefore they could not draw forth good spirit out of corn, but such as favours of the taste and smell of the malt. Which is not the fault of the corn, but of the artificer not operating aright in the preparation. of his malt, in distilling and rectifying. For if it were prepared a right in all things, óorn yields a very good spirit, not unlike to that which is made out of the lees of wine, In taste, odour, and other virtues. Which Art, although it be not known to all, yet it doth not

follow that it is impossible: Now I did not say that it is that common way, whereby that spirit, which is like to the spirit of wine, is distilled, but another which is more eubtil, and witty. Out of all vegetables is drawn a burning spirit, yet such is perceived by some difference of the taste, and odour, but that is not the spirits faults, but of the vegetable, as of herbs, seeds, corn, & etc. communicating their virtues, taste, and odour to the spirit: whence that spirit deserves to be called not simple, but compounded, for else all the burning spirit (being rightly rectified from its flegm) is made out of any thing, having the same virtues with the spirit of wine, although it seem improbable to some. I do not deny that one simple may yield more or less sweet spirit than another. For sweeter wines yields sweeter spirits: Also clear wine yields a sweeter spirit than the lees of wine, although they come forth out of one and the same vessel: For clarified wine, and that which is separated from the faeces yields a sweeter spirit than the Lees, and impure and hetrogeneal sediment, which corrupts the simple, and. sweet spirit, with a strong taste and smell: so that that may deservedly, being as it were simple, be preferred before this which is accidentally, corrupted. And this is to be understood of all other spirits. What hath hitherto been said, bath been spoken for the sakes of them, who have perswaded themselves that they could not perform chymical operations so well by the spirit of corn, as with the spirit of wine, for I never found any difference of them in the extraction of minerals and vegetables. Let him therefore that can, receive my opinion, and experience, seeing I will have nothing to do with contradicting Carper's:

Without hurt to others I dare not reveal the Art of distilling a sweet spirit with great profit out of corn, in all things like to that which made of the faeces of wine, viz, without the preparation or grinding of the malt, which shall haply be (*see Explicat. Mirac. Mundi) communicated elsewhere at some time or other, For this Book is not written for the publishing of secrets, but of a new invented distillation. But thou that wilt make a sweet burning spirit out of malt or honey; know this, that the corn must be brought after a certain peculiar manner into malt, and lose its ungrateful flavour before its distilling, and fermenting, or else after the wonted manner a certain ungrateful spirit will be drawn from thence, that cannot be compared to the spirit of wine. The whole Art thereof consists in a true preparation; for ungrateful things are by Art brought into gratefulness, and on the contrary grateful things are made ungrateful by negligence. And thus much for information sake.

Of the fermentation of Malt.

Take of Malt ground in a Mill as much as you please, upon which in a wooden vessel set up right, pour cold water, as much as will moisten it, and serve for mixtion and comminution; then also pour as much warm water as will suffice for the making the mixture moist and thin, and also warm; for it must be neither hot nor cold: which being done mix with it some new barn, and cover it with a cloth, and in a short times space, being exposed to heat, it will begin to ferment (wherefore the

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vessel Is not to be filled to the top) and leave it so long in fermentation, until the mixture descends, which for the most part is wont to be done the third day, and the malt will be ready for distillation.

Of the fermentation of Honey.

Neither bath honey any need of a singular Art in its fermentation, because being mixed with 6, 7, 8, or 10 parts of warm water, it is dissolved, and unto the solution is added ferment, as has been spoken concerning malt, which afterward is left covered in some heat for to be fermented, being fit for distillation when it becomes to wax hot. Now know that too great a quantity of honey makes a very slow fermentation, viz, of some weeks and months; wherefore for acceleration sake, I advise that a greater quantity of water be added; although otherwise It yields plenty of spirits, but ungrateful, which therefore I advise no body to distil as being unprofitable, unless any one know how to take away the ungratefulness thereof. (See the Comsolat. of Navigators.)

Of the preparation of Fruits, Seeds, Flowers, Herbs, Roots, & etc.

The fruits of trees, as Cherries, Plumbs, Apples, Pears, Figs, Juniper-berries, Elder-berries, Dwarf-elder, and Mulberries, & etc. are bruised in wooden vessels, with wooden pestils; and upon them being bruised, is poured warm water, and ferment added to quicken it, as bath been above said of malt. Seeds are broken in a mill, flowers, herbs

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and roots, are cut small, and are stirred up to fermentation by mixing of warm water, and barn or yeast.

An Annotation,

Before you distil the aforesaid vegetables prepared by the help of fermentation, diligently weigh, and accurately observe whether the mixture be sufficiently fermented, for sometimes there is too much cold, or hot water put to it; sometimes the vessel is not well covered, by which means the cold air is let in, whence the fermentation is hindered, and consequently the distillation of the spirit; For by the help of fermentation the burning spirit of the vegetables is set at liberty, without which it cannot be done; also the distillation is hindered by too much hast, as well as by too much delay; for if you begin to distil before the time, viz, fermentation not being yet perfected, thou shalt have but few spirits; wherefore also the better part is, by many that are unskillful, cast to the swine, but without any great loss, if the matter were malt, because that swine are fed therewith; but not so if other vegetables were the matter of the distillation. Also too much slowness where the matter begins to be sowre before it is distilled, yields very few spirits, that which often happens, whilst herbs, and flowers, & etc. are out of ignorance left in fermentation 3, 4, 5 and more weeks, before they be distilled, for the greatest part of the spirit is then turned to vinegar, which would not be so very ill done, if so be these men knew how to clarifie the remainders, and turn it into

vinegar, that nothing thereof might be lost; for the vinegars of herbs, flowers, seeds, and roots are not to be contemned. And so often times (athing to be lamented) the better part, if they be spices, and precious things, is lost.

The matter of the distillation, and other choice things, as seeds and herbs are cast away with loss; wherefore for admonition sake I was willing to add such things that the operators may have an opportunity to consider the matter a little more profoundly with themselves, or at least of learning the art of distilling from countrymen, who do not suffer their malt to putrefy, grow sower or mouldy, before they fall upon their distillations, but presently fermentation being made (the third or the fourth day) begin their distillation.

But some one will object, that my vegetable Spirits are not pure by reason of the ferment that is mixed, having in it self a spirit. I answer, there is not so great a portion of the ferment mixed which can corrupt the vegetable spirit. For although some spoonfuls of ferment yielding but a few drops of spirits be added to a great quantity of the vegetables; yet there can come no hurt or detriment to so many quarts of the vegetable spirit. I have seen some supercilious men that would not add ferment to the matter of their spirit, but sugar or honey, by which they would promote fermentation, and so have thought to get a pure spirit, not considering that honey and sugar, after fermentation are made to yield their spirit also, whereof one spoonful yields more than ten or twenty of Barn: But honey and sugar fermenting not without difficulty themselves, how can they promote the fermentation of other

things? Who also have had experience, that the addition of their ferment bath been superfluous, whilst their flowers and herbs have stood some weeks in maceration, before they begun to ferment, and that often times they have contracted an acidity, mustiness and stink, the reason of which was an unsutable ferment. There are indeed the fruits of some trees that have a sweet and full juice, as grapes, cherries, apples, pear's, figs, & etc. which need not the addition of any ferment, having a natural ferment of their own, but other vegetables not so, being lean, as hearbs, flowers, and roots. It is necessary there to promote the fermentation of them by the addition of a suitable ferment, lest in length of time these herbs and seeds lose their spirit exhaling in maceration, And thus much I was willing to say for information sake, and indeed for the sake of them who seek after the best and choisest medicines, wanting a good burning spirit as a companion applicable to them. For this spirit came not only by it self, as AQUA VITA, Into a medicinal use as well internal as external, especially that which is prepared of cordial, and cephalick herbs; but also being united with the proper oils of those herbs in many desperate diseases, where it could put forth its virtues eminently.

And thus much suffieth concerning the preparation of vegetables that goes before the distillation of burning spirits.

The manner of distilling in general followeth.

He that is going to distil, bath need to stir his fermented matter

very well with a stick, that the thicker parts may be well mixed with the thinner, and then he must fill therewith his distilling vessel set upon a treefoot, and joined to the copper globe in the furnace on one side, and to the refrigeratory on the other, the joints in all places being well closed either with Ox-bladders, or with starch and paper. Also the interior part of the globe in the distilling vessel must be fenced with a copper or wooden basket, that the herbs, seeds, and other things enter not into the globe, into which only water must come. Also the upper half must be close stopped with a fitting stopple wrapt about with linnen cloths, (viz, that hole by which the matter to be distilled is put in) like to vessels of wine that are stopped. Which being well done, you must kindle the fire in the furnace under the globe, until all the matter in the whole vessel boil well, and that burning spirit rise, and go out, through the refrigeratory (where it is condensed) into the glass receiver that is set under it, no less than that distilled out of a still, and you must continue the fire till all the spirit be come forth, which you may know by the taste. Which being done, and all things being cold, let the remainders be taken out by the lower large tap-hole, for meat for swine, or other uses. The spirit that is drawn off may be exalted, and rectified at your pleasure in the same vessel, being first made clean together with the refrigeratory. Note well, that sometimes there is left a fat oil with the flegm in rectifying of the spirit, proceeding from that herb of which that was the spirit, which did distil off with the spirit from the matter with a strong fire in the first distillation, but in the rectifying could not ascend with

the spirit in a gentle fire, but is constrained to remain with the insipid flegn. And this oil also bath its virtues, especially that which is rectified by a glass gourd in Balneo, with the spirit of salt, and clarified. Now the like oil is got almost from all herbs, roots, seeds, flowers, and fruits, but out of one subject more than another, according to the hot and cold temper thereof. Especially the sediment of wines yields a good quantity of such oil, which being rectified is a medicinal true oil of wine, but not before endued with a sweet savour, and it is an excellent cordial, although I know no body that knew this before.

And thus I have shewed the general way of distilling, burning spirits, by help of the aforesaid wooden distillatory. Now also follows.

The manner of distilling Spices, Seeds, Flowers, Herbs, Roots, Woods, & etc.

First, the seeds must be broken in a mill, flowers, herbs, and roots cut small, the woods broken or rasped, upon which afterwards a good quantity of water (in which they may swim) must be poured for the maceration of them, so that when the distillation is ended there may remain some water, lest for want of water they be burnt in the distilling, and yield an oil favouring of an EMPYREUMA, and not sweet. Neither is too great a quantity to be poured upon them, but as much as shall serve to prevent the burning of the aforesaid vegetables in the distilling of the oil thereof, And indeed fresh vegetables may presently without any

foregoing maceration, being put with their proper water's into the distilling vessel be distilled, But they be dry may for the space of some days be macerated before they be distilled. Also the water appointed for maceration must be salted, for the better molifying, and opening the aforesaid materials, that they may sooner yield their oil. Now green and fresh need not any salt water, yet it will not be hurtful to mix some therewith, because salt helps the boiling water, so as to make the oil more easily to ascend. It also helps and furthers distillation as doth Tartar and Allome, if they be rightly mixed and ordered. Which being all rightly done, the materials that are macerated must be put by a funnel into the distilling vessel, and fire must be given as hath been spoken concerning the burning spirit, and the oil of the seed, or wood macerated in the water will come forth in the distillation together with the water. And although by this way more oil comes forth, viz. Maceration being made by the addition of salt, than without salt, by the help of the sweet water alone, as is the fashion in all places almost to distil oils of spices; yet much remains inseparable by the water, and consequently not to be sublimed with the water. Therefore the better way is that which shewed. in the first part to be performed with the spirit of salt, which if you please you may follow, All the oil being come forth (which is perceived by the changing of the receivers) the fire is to be extinguished, and the remainder is to be taken out, which if it be of seeds, herbs, or fruits, may, being yet warm, be fermented by the addition of ferment for the distilling of the spirit, of which there cannot be so great a quantity by reason of taking away of

the oil, as otherwise is drawn out of things that have not lost their oil: For all burning spirits partakes of much oil, of the essence, and nature whereof more a little after. Now spirits must be made without the addition of any salt, for salt hinders the fermentation, without which the burning spirit cannot be had. But the water that is distilled together with the oil, is to be set in a certain temperate place, until the oil ascend, and swim upon the water, from whence it is to be separated with a Tunnel (of which in the fifth part,) also there are some oils which do not ascend, but fall to the bottom, which are also to be separated with a Tunnel, and kept for their uses, Now how these oils may be kept clear long, and not contract any clamminess, shall be taught in the fifth part: but how they may after they have lost their clearness by long standing, and are become tenacious, be restored and clarified again, is taught in the first part, wherefore I need not here repeat it.

How Oils are to be coagulated into Balsomes.

It hath been the custom a long time to turn aromatical oils into Balsoms, where always one hath been willing to excell another in this Art, which nevertheless was nothing hitherto, but for a washing and cleansing; for they could not be used inwardly, but only outwardly for their odour to comfort the heart and brain. Now the aforesaid oils are coagulated many ways, and are made portable in Tin, Silver, and ivory boxes.

Some have mixed the fat of a lamb with them by help of heat, and have turned them into a liniment, which they have Coloured with divers colours; as for example, they have corrupted the oils of green herbs; as rosemary, marjoram, lavender, rue, sage, with a green colour, by the admixtion of virdigrease (which is noxious to the head and heart) where one corroborates and refresheth, another destroys. They have tinged the Balsom of Cinnamon, and LIGNUM RHODIUM with a red colour by the help of a poisonous Cinnabar. Others that are more industrious, have tinged their Oils with extracted colour's of vegetables, which balsoms are more safely taken inward: But are not durable, acquiring a sliminess and stink; wherefore they have mixed white wax to coagulate them: By which means they are become more durable without stinking; but yet at length of time so tenacious, that being smeared or rubbed upon the skin, they stick fast by reason of the wax that is mixed with them: at last others have found out a better way of coagulating aromatical oils, and other things, viz., by the addition of the oil of Nutmeg made by expression, having lost its odour and colour by spirit of wine; which they called the MOTHER OF BALSOMS. And this way hath been a long time concealed by Apothecaries as a great secret, until at length it is become common, so that balsomes prepared after this manner are sold almost In all shops:

But although that be the best way, yet they are not durable balsomes that are made that way, because they lack salt. I do not contemn and disapprove of Balsomes made after this way, for if a better way had been known., better had been made, for no man is obliged beyond his power. Wherefore they are not only to be excused, that have used Lambs fat,

Wax, and the oil of Nutmega in the making of their Balsomes, but also to be honoured for their communication. Now seeing the aforesaid Balsomes cannot be taken inwardly, nor be so well outwardly administered by reason of their unctuousness, others have consulted to congeal the Oils by the admixtion of their own proper fix-salts: And Balsomes prepared after this manner are made free from clamminess, or tenaciousness, and may be dissolved in wine, beer, or any liquor.

Wherefore they may be not only conveniently taken inward, but also more fitly than those old, be rubbed outwardly for the odour's sake, because they are easily washed off again with water. They do not only give a most sweet odour being rubbed, but also by reason of the admixtion of the fixed salt, having the nature of salt of Tartar, do beautify the skin. Wherefore they are to be commended, being dissolved in fair warm water for a lotion for the head, and face; not only because they beautify, but corroborate with their excellent odour; which those fat Balsomes cannot do, Wherefore this way is to be preferred far before the other.

Let him therefore that will, receive what I have said, for RARE AND NEW THINGS ARE NOT ALWAYS ACCEPTED, especially BEING OBSCURE: but I hope for the approbation of the age to come.

The manner of preparing follows.

Take the remains of the burning spirit, and being put into a sack, press it hard: reduce the water pressed out into vinegar, and of roses

thou shalt have a rose vinegar, and of other things another, being the best in a Family for to season meats: then take the remains out of the sack, and reduce it to white ashes in a potters furnace, upon which pour the flegm of its own burning spirit (being separated) to extract the salt, from which evaporate again all the humidity in a glazed earthen pot: calcine the coagulated salt gently in a clean crucible, and it will be white and be like to salt of tartar in taste; from which abstract, sometimes its own proper burning spirit, clacining the salt first every time; and the spirit will be so exalted by its proper salt, that it will presently assume its proper oil, and will, being poured upon it, associate it to it self so as to be perceived no more in the spirit, which will remain very clear: Which being done, calcine the salt yet once more very well in a crucible, and dissolve so much of it in its proper flegni, as sufficeth for the coagulation of the oil, then mix this solution with the burning spirit, mixed with its oil, and set it in a vial of a long neck well stopt, in Balneo, that the spirit may not exhale, in the coction of it, and in the space of a few hours there will be an union of the mixture which will be as white as milk. Which being done, let the glass cool, for there is a conjunction of the spirit, oil, and salt, so that neither can be discerned from another, which is to be poured into a vessel of a wide mouth, and it will be congealed in the cold like a white ointment, not only to be anointed withal, but also to be dissolved in any liquor, being of an excellent odour, which may also be given inwardly very conveniently, and being used outwardly it makes the skin beautiful and sweet, wherefore this is that most

desired balsome of Princes and Ladies. And by this way the three principles of vegetables, being separated, and purified, are again reunited, in which union there is found the whole virtue, taste, and odour of the vegetable.

Note well, That he that will colour balsomes, must draw the colour out of vegetables with spirit of wine, which he must make to be coagulated together with it. After this aforesaid manners therefore you may draw out of any vegetable that hath in it salt, spirit and oil, soluble and well smelling balsomes without the addition of any other strange thing, which are not to be contemned.

And because here also is taught that most odoriferous balsome of roses, for roses yield but a little oil, without which that cannot be done, know that only roses or rose leaves also are to be taken for the making the aforesaid balsome, but also together with the leaves those whole knots; for that yellow that is in them yields that oil, not the rose leaves, & etc. And let what hath been said suffice concerning our preparation of balsomes, which if they be rightly made, are not I suppose, to be contemned, neither do I reject those that are made without salt: Let him that hath better communicate them, and not carp at ours. And so I would that all and each process should be comprehended under some one general, viz, of distilling burning spirits, and oils, by the help of a wooden distilling vessel, and their conjunction by the help of their proper fixed salt, I could here add more things concerning the use, and virtues of spirits of wine, and of those most sweet vegetable oils; but because they are clearly enough spoken of by others, I account

it a superfluous thing to repeat the sayings of others, being contented with the description of one only general process, which you may imitate in other particulars.

There follows now the use of the second woódenvesael, which is to be used instead of those of copper Or lead, serving for distillations, digestions, extractions, and fixations.

The vessel being made ready according to the prescription set down before, there is nothing else to do, than to fit the furnace with the globe, and at your pleasure to heat water in it, with a government of the fire in the furnace. Now all things may here be done, which otherwise are done in a common BALNEO; where there is no other difference but of vessels; here is used a wooden vessel, there a copper, leaden, or iron, & etc. In this operation also is used the same furnace with the same globe, which was used above in the distillation, wherefore you need add nothing else beside, for nothing is more common than a BALNEUM in distillation; let the demonstration therefore of the use of the copper globe suffice. Now I thought it worth while to set down some Ch.y- mical medicinal extracts, not common, which may be made by the help of this BALNEUM, which being rightly prepared do many things in many diseases.

And first a vomitive Extract.

Take an ounce of the flowers of Antimony, of purified Tartar 2 ounces, of sugar-candy 6 ounces, of rain water two pints, being mixed together, set them in a strong vial in BALNEO for to be cocted, and make them boil strongly the space of ten or twelve hours. Then the BALNEUM being cold, take out the glass, and pour forth the decoction, and filter it through a brown paper put into a tunnel; the filtered water will be reddish betwixt sweet and sowre, which take (the faeces in the filtre being cast away) and in a small gourd glass draw off all the moisture with a gentle fire in BALNEO unto the consistency of honey of a brownish colour, upon which again pour a pint of spirit of wine, poured forth into a vial with a long neck; and set it in BALNEO with a moderate heat the space of eight or sixteen hours, and then the spirit of wine will separate, and extract the essence, which will be more pure and noble, the faeces being left in the bottom; which after all things are cold are to be separated by the help of Filtration through a double brown paper. Then take the red tincture that is filtred, and in a gourd glass in a gentle BALNEO draw off almost all the spirit of wine until there remain a matter like a very sweet syrup, which being taken out keep as a most excellent vomitive, most profitable in many diseases, where other Cath- articks can do nothing. For this medicine works most gently, wherefore it may be given to children of a year and half old without danger, and also to old men. This medicine purgeth and attracts all humors from the nerves, and. veins, opens all obstructions of the liver, spleen,

lungs, and kidneys, by which means many most grievous diseases are cured.

I never found a vomitive comparable to this, which works quickly and safely. The dose of it is from grain 1, 2, 3, 1i, to 10, and 30. according to the age and sickness. It may be taken by it self, or in wine, beer, & etc. and it will within a quarter of an hour begin to work, and ceaseth within two hours. Sometimes it doth not provoke vomit at all, but only stools, where a glyster is very helpful if it be given a little before the administering of the aforesaid medicine, being made of two or three spoonful of oil Olive, and salt water; for the glyster prepares the way below, so that it seldome then works by way of vomit: when also the patient may presently after the taking of the medicine hold hot tosted bread to his mouth and nose, which hinders vomiting and promotes the operation by stool, but in my judgement it is better not to hinder the medicine seeking a spontaneous way of operation, and not forced: For vomiting is more convenient for some, than purging by stool. Now these things I have spoken for the sake of those, who although they abhor vomiting, yet desire to be purged by the essence of Antimony, which is of all that I know the most safe, and sweet Cathartick. For it searcheth the whole body far better than all others, and frees it from many occult diseases, the which all other vegetable Catharticks could not do, It hath also this commodity in it, that although by littleness of the dose, or the strong nature of the patient it doth not work by vomit or stool, yet it doth not like other medicines hurt the body, but works either by sweat or urine, so that Antimony being rightly

prepared is seldome administered without profit. When as on the contrary, vegetable Catharticks being given in less dose or by reason of some other causes do not work, although they do not make the body swell, and produce manifest diseases, yet they threaten to the body occult sicknesses.

Now the ARCANUM of Antimony doth not only not do hurt, if it do not sensibly operate, but by insensible working doth much good to the body of man. Wherefore there is a great difference betwixt purging minerals, and vegetables. For minerals are given in a less dose without nauseousness, but vegetables with a great deal of nauseousness, and sometimes with danger to the sick in a greater dose. Now that nauseousness also proceeding oftentimes from the great dose of the ungrateful bitter potions does more hurt than the potion it self. I wish that such kind of gross medicines were abolished, and the sweet Extracts of Vegetables and Essences of Minerals were substituted in their place.

A purging Extract.

Take of the roots of black Hellebore gathered in fit time, and dried in the air, one pound, the roots of Mechoacan, Jallap, of each four ounces; Cinnamon, Anniseed, and Fennel-seed, of each one ounce; of English Saffron a dram, powder all these Ingredients, then pour upon them the best rectified. spirit of wine, in a high glass gourd, and upon this put a blind Alembick, and set it in digestion; in Balneo until the spirit of wine be tinged red, which then decant off: and pour on fresh, and

set again in digestion; until the spirit be red, then pour on fresh again, and do this so often until the spirit will no more be tinged red, which commonly is done at three Times. Mix these tinged spirits, filter them, and in Balneo by a glass Alembick, with a gentle heat draw them off from the Tincture, and a thick juice will remain at the bottom of a brownish colour, which you must take out whilst it is yet hot, and keep it in a clean glass for its uses. The Spirit of Wine drawn off from the extract may be reserved for the same use. Now this extract is given from grains 3, 6, 9, 12, to 31; according to the age and strength, being mixed with Sugar, it hath not an ungrateful taste, and it works gently, and safely, if it be not given in too great a dose. And if thou wilt have it in the form of a Pill, mix with it being yet hot, an ounce of clear Aloes, and half an ounce of Diagridium powdered, being mixed bring it into a mass for Pills, and keep it for your use, The dose is from grain 1, to a scruple. It evacuates all superfluous humors, but it is not to be compared with the medicine of Antimony. And this extract I put down for the sakes of those that fear Minerals, and abhor Vomits, which in my judgement is the best of all vegetable Catharticks.

A Diaphoretical Extract.

Take the wood of Sassafras, Sarssaparilla, of each six ounces; Ginger, Galengal, Zedorary, of each three ounces; long Pepper, Cardanzoms, Cubebe, of each an ounce; Cinnamon, Mace, of each half an ounce; English Saffron, Nutmeg, Cloves, of each a dram: Let the woods be rasped, the

roots and apices powdered, pour upon them, being mixed, the spirit of wine, and let the tincture be drawn forth in Balneo, as hath been above- said of the purging Extract, evaporate away the spirit to the consistency of honey, which keep for your use. It is good in the Plague, Fevers, Scorbute, Leprosie, French-
pox, and other diseases proceeding, from the impurity of the blood, curing them by sweat. The dose of this Extract is from a scruple to a dram with proper vehicles: it provoketh sweat presently, driveth away all venenositities from the heart, and mundifies the blood.

And although it be a most effectual vegetable Diaphoretick yet it may not be compared to those subtile spirits of minerals, of which in the second part. Also animal diaphoreticks have their commendations, as the flesh of vipers, the fixed salt of spiders and toads, in their peculiar operations, where each alone without the mixture of any other thing puts forth and sheweth its operations; neither are animal and vegetable diaphoreticks to be compared to the mineral, as BEZOARTICUM MINERALE, ANTIMONIUM DIAPHORETICUM, and AURUM DIAPHORETICUM.

A Diuretical Extract.

Take the seeds of Saxifrage, Carroway, Fennel, Parsly, Nettles, of each 3 ounces, the root of liquorish, the greater burr, of each an ounce, the powder of woodlice half an ounces Let these being mixed and powdered be extracted with spirit of Juniper according to art: then mix these following things with the extracted matter: Take the salt of Amber,
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Soot, Nettles, of each half a dram, purified Nitre a dram: Let these be powdered, and mixed with the extract and this mixture be kept for use. The dose is from a Scruple to a dram, in the water of parsly, fennel, & etc. This extract forceth urine, opens the ureters, purgeth the reins, and bladder from all viscous flegme (the mother of all tar- tareous coagulation) viz, if it be used timely: In this case is commended also the solution of flints, and crystals, made with spirit of salt. A greater commendation have salts of nephritick herbs made by expression, and crystallisation, without calcination, the preparation whereof shall not here, but elsewhere be taught.

A Somniferous Extract.

Take of THEBAIC OPIUM four ounces, of Spirit of Salt two ounces, purified Tartar one ounce, set them being mixed in maceration in Bal- neo in a glass vessel for a day and night, and the spirit of salt with Tartar will open the body of the OPIUM, and prepare it for extraction, upon which pour half a pint of the best spirit of wine, set it in a gentle Balneo to be extracted. Decant off the spirit that is tinged, and pour on fresh, set it in digestion till the spirit be coloured. Then mix the extractions together, and put to them in a fresh glass gourd two drams of the best Saffron, of oil of Cloves a dram, and draw off the spirit of wine in Balneo, and there will remain a thick black juice, which is to be taken out, and kept in a clean glass vessel. The dose thereof is from one grain, to five or six, for those of a mans

age, but to children the sixth or eight part of a grain. It may be used in all hot distempers without danger. It provoketh quiet sleep, mitigates pains as well outward as inward, it causeth sweat; but especially it is a sure remedy for the epilepsie in children that are new-born; for as soon as it is given to them to the quantity of the eighth part of a grain in wine, or womans milk, there presently follows rest, and sweat with sleep, by which means the malignity is expelled, the children are refreshed, and desire victuals, and the fit returns no more afterwards. Although haply the like symptoms may be perceived again, yet if the aforesaid dose be administered again, the children are refreshed, and cured wholly, whereas otherwise they would have died, & etc. whereof I have not restored few with this medicine. Moreover also there are very effectual anodine medicines, as those volatile spirits of vitriol, allome, Antimony, and other minerals, with which, as also with that narcotick sulphur precipitated from the volatile spirit of vitriol, nothing may be compared.

A Cordial Extract.

Take red roses four ounces, of the lilly of the valley two ounces, the flowers of borage, rosemary, sage, of each an ounce; cinnamon, hgnun aloes, of each two drama; cloves, mace, nutmeg, galangal, cardamoms. the lesser, of each half an ounce; the shavings of ivory, harts-horn, of each an ounce; of ENGLISH saffron a dram, of NUX-VOMICA a dram: Mix them and reduce, them to a fine powder, and let the tincture be extracted

with spirit of wine in Balneo, which is to be drawn off again, unto a just consistence. Let the extract be kept for use. It may be used in almost all faintings, and other affects that are not joined with a preternatural heat. The dose thereof is from grains 3, 6, 9. to a scruple with proper vehicles; being often administered it refresheth the spirit, corroborates the brain, and other parts of the body. It is made more efficacious by the adding of the essences of minerals, especially of gold, of which thing see the first part concerning the sweet oil of gold.

Of an odoriferous Extract.

I need not teach the making of any odoriferous vegetable extract, because the manner of drawing forth, or distilling oils of vegetables that have sweet odors, hath been shewed a little before, as of herbs, flowers, and seeds, which are the most noble, and sweet essences of vegetables, by the odour whereof the heart and brain are corroborated, which being reduced into balsomes are made transportable. Better extracts therefore, and more excellent cannot in my judgement be made out of vegetables, than those aforesaid oils, unless any one would mix aromatical extracts made with spirit of wine with metallick solutions, and being mixed digest them, then there will certain most odoriferous oil go from the extract not only more efficacious, but more excellent than that common distilled oil by reason of the admixtion of the spiritual metallick virtue, especially of gold and silver, dissolved in the acid

MENSTRUUM communicating its virtues to the Aromatical oil. Moreover any vegetable oil may be exalted in virtues and odour by the help of spirit of urine, or salt Armoniack, by the help whereof not only odoriferous oils are exalted, but also the inodorous oils of vegetables are made odoriferous, if they be a while digested in spirit of urine: and not this only but every mineral, and metallick sulphur, although the odour thereof be bound up with most strong bonds, is opened by the benefit thereof, and is reduced by digestion in a very little time into a most sweet and odouriferous essence. Lixivial spirits exalt the odours, and colours of sulphur's; acid purge sulphurs, but change their colours and odour's. Musk and Civit get the sweetness; and excellency of their odour from subtile urinous spirit of a certain Cat, digesting some certain fat and converting it into such a kind of most odoriferous matter.

And let this that hath been said suffice concerning Extracts, which might have been omitted, because many of these kind of Extracts are found in the writings of other authors in many languages: But I was willing to set down these, lest this book might seem to contain in it nothing else besides the new way of distilling, being furnished also with good medicines.

Of Baths.

A little before hath been given a description of a Tub for a Bath in which any one may sit with his whole body except his head, not only to be washed in sweet warm water, whether medicinal and mineral, but

also to sweat in without water, where the vessel is heated by warm vapour's, either of sweet waters, or minerals. And every one may provide such Baths for himself according to his necessity at home, whereby the same diseases are cured as those that are cured by the help of natural Baths, so that he need not for the baths sake go a great journey, but may stay at home with his family and follow his Calling without trouble, when. he hath occasion and need to use them.

And whereas it cannot be denied, that by the use of the Baths most grievous diseases which cannot be cured by Physicans, are happily cured; I was willing for the sake of my neighbour to publish this instrument together with the preparation of mineral waters; which publishing will not without doubt be without profit, and advantage. Wherefore I will in brief shew you the preparation of mineral, and sweet waters, and their use, and first,

Of a Bath of Sweet or common water.

There is no art to make a Bath of sweet water, for you have nothing else to do, then to fill your vessel with river or rain water, and to make a fire, which by the help of the copper globe will heat the water', which being sufficiently heated, you may sit in it, and cover the Tub, that the hot vapour's evaporate not, nor' the cold air enter in, and cool the exterior parts of the body: Wherefore also you must apply a clean linnen cloth about your neck, lest the warm vapour's evaporate there: which being rightly observed, you may sit the space of 1, 2, 3, hours,

or as long as you please or your sickness require. You must keep a continual heat as much as is necessary, which may be done by the help of that globe. If you be thirsty in the mean time you may drink some proper distilled drink according to the nature of your disease, of which thing nothing now, because I am resolved to write a peculiar BOOK DE BALNEIS, and here only shew the use of that copper globe in heating of Baths. And although there be not a perfect instruction of all, yet of some Baths, and their uses there shall a short instruction be given in this place.

Of the nature, and property of natural Baths.

Know that the greatest part of medicinal waters in GERMANY, and other countries, as well hot as cold carry with them from the earth a certain sulphureous acidity, more or less: in which acidity consists that medicinal faculty and virtue of this or that water. And if those waters lose their odour and taste by the exhaling of their subtle spirits, then also they loose their virtues; although also there be found some waters, which have not only a spiritual sulphur, but also are impregnated with a certain mineral, or metallick body mixed with Allome, or Vitriol, which comes not elsewhere then from the common water running through the mines. There are found also other baths, the power and virtue whereof consists not in any spiritual sulphur, nor in any metallick body mixed with salt, but only in a certain spiritual salt mixed with a certam subtil fixed earth, which waters do not run through metallick nines

as others do, but rather stones of the mountains calcined with a sub-terranean fire, whence also they borrow their subtil acidity with their insipid earth. And this no man will deny that hath a knowledge of volatile and fixed salts of minerals, and metals: the which I am able to demonstrate with very many, and most evident reasons, if time and occasion would permit; but it shall be done sometime or other as hath been said in a particular treatise. Now therefore I will only teach how by salts, minerals, and metals, artificial Baths may be made, which are not only inferiour to the natural in virtue, but also oftentimes far better, and that without much cost or labour, which any one may use at home in stead of the natural for the expelling of diseases, and recovering of health. And although I am resolved to set forth a book that shall treat largely of the nature, and original of Baths, and of their use; yet I am willing now also to say something in brief concerning it, and that from the foundation, seeing that there are so many different opinions of learned men, and those for the most part uncertain.

As concerning therefore the original of the acidity as well volatile, as corporeal, as also the heat of baths, know that is not one, and the same; for else each would have the same properties, but daily experience testifies the contrary: For it is manifest that some Baths help some diseases, and others are hurtful for them, which comes from nothing else but from the difference of the properties of the mineral waters proceeding from a diversity of mines impregnating those waters. In a word, sweet waters attract their powers, and virtues in the caverns of mountains from some metal and minerals of divers kinds, that have naturally

a most acid spirit of salt, as are divers kind of marcasites containing copper and iron, and sometimes gold and silver; also kinds of vitriol and Allome called by the ancients MISII, RARII, CHALCITIS, MELANTERIA, and PYRITIS, whereof some are found white like metals, but others dispersed in a fat earth, of a round figure in greater or lesser pieces:

which sulphureous salt mines whilest the water run through, and humectates, that spirit of salt is stirred up, having got a VEHICULUM, and falls upon the mines by dissolving them, in which solution the water waxeth warm, as if it had been poured on quick lime, or like spirit of vitriol, or salt mixed with water, and poured on iron, and other metals; where continually and daily that water running through the mines whose nature and properties it imitates, carrys something with it: wherefore there are so many, and such various kinds of Baths as are the mines by which the water is heated. Let him that will not believe take any mineral of the aforesaid quality, and wrap it up in a wet linnen cloth for a little while, and he will see it experimentally that the mineral stone will be heated by the water, and so heated, as if it were in the fire, so as thou canst scarce hold it in thy hand, which at length also by longer action will cleave in sunder and be consumed like quick lime.

I will publish some time or other (God willing) more fully, and clearly in a peculiar treatise this my opinion, which I have now delivered in very few words. Although to the sick it be all one, and it matters not to them, from what cause the baths come, and whence they borrow their virtues, if so be they may use them; this controversie being left to natural Philosophers that will controvert it, which none

of them can better decide than a skillful Chymist, that hath the knowledge of minerals, metals, and salts.

And first of sulphureous Baths that have a subtil acidity.

In the second Treatise I have demonstrated the manner of distilling aubtil, volatile, sulphureous spirits, viz, of common salt, vitriol, allome, nitre, sulphur, antimony, and other salts of minerals, and metals, and their virtues, and intrinsecal properties, now also I will shew their extrinsecal use, as they are to be mixed with waters for Baths. The vertuestherefore of Baths proceed not from insipid water, but from those most subtile, volatile, sulphureous, and salt spirits; but these being of themselves not mixed with water unfit for Baths, to be used for recovering of health, by reason of their too great heat, and subtility; the most high God hath revealed to us unworthy and ungrateful men his fatherly providence shewing to us by nature the use of them, and the manner of using of them for the taking away of diseases; which (nature) being never idle, works uncessantly, and like a handmaid executes the will of God, by shewing to us the various kinds of distillations, transmutations, and generations, From which teacher we must learn all arts and sciences, seeking a certain, and infallible information, as it were out of a book writ with a divine hand, and tilled with innumerable wonders, and secrets. And this is a far certainer knowledge then that empty, and imaginary Philosophy of those vulgar disputing Philosophers. Dost thou think that that true Philosophy can be sold for a hundred Royals? How can any one judge of things hid in the earth,

who is willfully blind in things exposed to the light of the Sun, hating knowledge? I wish knowledge were sutable to the name: how can any one that is ignorant of the nature of fire, know how to work by fire? Fire discovers many things, in which you may as in a glass see things that are hid: The fire shews to us how every thing, waters, salt, minerals, and metals, together with other innumerable things are generated in the bowels of the earth by the reflexion of that central, and astral fire: for without the knowledge of fire all nature remains vield, and occult. Fire (always held in great esteem by Philosophers) is the k,y for the unlocking of the greatest secrets, and to speak in a word, he that is ignorant of fire is ignorant of nature with her fruits, and he hath nothing, but what he hath read, or heard, which oftentimes is false, according to that: HE EASILY SPEAKS UNTRUTHS THAT SPEAKS WHAT HE HATH HEARD.

He that is ignorant knows not how to discern betwixt the truth and falsehood, but takes the one for the other. I pray thee, thou that are so credulous, dost thou think that thy teacher writ his books from experience, or from reading other Authors? May they not be corrupted and sophisticated by antiquity, and frequent description? Also dost thou understand the true, and genuine sense of them? It is better to know, than to think: for many are seduced by opinions, and many are decieved by faith that is without knowledge.

And thus much for youths sake I was willing to say, that they would not spend their tender years in vanities, but rather would make trial in the fire, without which no man obtains a true knowledge of natural things; which although it seem hard in the beginning, yet it is pleasant in old age.

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Now follows the mixture of those Subtile mineral, sulphureous, and salt spirits with water.

As concerning the weight of the aforesaid spirits that are to be mixed with sweet water, giving it the nature, and property of natural baths, I would have thee know, that of those, which in the second part I shewed to be various, and divers, being, viz, not equal in virtue, the same weight cannot always be so accurately observed: seeing also there is a Consideration to be had of their strength, and of the strength of the patient.

Now you may at the beginning mix one or two pound of the spirits with a sufficient quantity of the water, and then by sitting in it make trial of the strength of the artificial Bath, which if it be too weak is to be increased by adding a greater quantity of the spirits, but if too strong, then it is to be diminished by abstraction; of which more at large in .ARTE ROSTRA BALNEATORIA. Now this observe, that it is best to make Baths in the beginning weak, then stronger by little and little by degrees, as the nature of the sick is accustomed to them, that it be not overcome by the unaccustomed use of them being too strong. Wherefore Baths are to be used with discretion, and cautiously, for which matter I refer the reader to my APTEM BALNEATORIAM, in which he shall find plain, and perfect instruction; let it suffice therefore that I have shewed the use of the Copper Globe, in heating Baths, which let the sick take in good part, until more come. Now follows the use.

Of Sulphur Baths.

Apply the furnace with the Copper Globe to the Tub after the manner aforesaid, and pour in a sufficient quantity of sweet water, which make hot with the fire kindled in the furnace by the help of a globe: which being sufficiently warmed make the patient sit in it, and pour into it so much of the sulphureous spirit as is sufficient; which being done cause that the tub be covered all over, that the volatile spirit vanish not, and as necessary requires, continue the heat till the patient come forth. Know also that the water is to be changed every time, and fresh spirits to be mixed. And this is the use of the Copper globe, in heating baths of sweet or medicinal water, and that either of vegetables, or mineral, and this made sulphureous by art or nature; whereby most grievous, and otherwise incurable diseases are happily cured: Of which enough now in this Treatise.

The use of the Copper Globe in dry Baths, which are more excellent than the moist in many cases.

I might have put off this matter into its proper, Treatise, where all things shall be handled more largely, and clearly: yet by reason of some unthought of impediments for a while procrastinating the edition of the promised Treatise, I am resolved to say something of their use, after I have made mention of the humid, and indeed not only of the use of those subtile, sulphureous, and dry spirits, but also of the

use of subtile, vegetable and animal spirits which are medicinal, because in some diseases dry baths are more commodiously used, than moist. He therefore that will provoke sweat by a dry bath without water, let him provide a wooden box, or wooden instrument convenient to sit in, standing upon a stool boarded through that you may raise it up more or less according as you please, and having boards appointed for the arms and feet to rest upon. This box also besides the great dore must have also a little dore serving for the putting in of a burning lamp with spirit of wine, or of any earthen vessel with coals for to heat it. (See the sixth figure.) The box being well warmed, let the patient go in, and sit upon the stool, let the box be very close shut all about, and the furnace with the Copper Globe be fitted thereunto, under which let there be a small fire kindled, by help whereof the volatile spirit growing warm, goeth forth into the box like a most subtile vapour, penetrating all about the patient. But when this spirit is not sufficient to heat the box, set in it a burning lamp with spirit of wine, or some earthen pot with coals (the best whereof are made of Juniper or the vine, especially of the roots as being such that will endure long, and cannot easily be extinguished by the vapour's of those spirits) that the patient take not cold, and the vapour's of the spirits may the better penetrate the body of the patient. Let the wick for the spirit of wine in the burning lamp be incombustible made of the subtile threads of gold, of which thing more in ARTE BALNEATORIA. In the mean time that volatile spirit penetrates, and heats the whole body, and performs its office, being this way used better than by being mixed with water. When the

patient hath sat there long enough let him come forth, and go into a warm bed to sweat. Now before he go into the box let him take a dose of that volatile spirit, inwardly which is used outwardly to provoke sweat, and accelerate the action. And by this means not only those volatile sulphureous spirits of salts, minerals and metals, are used outwardly without water to procure sweat, but also the spirits of many vegetables, as of mustard seed, garden cresses, crude tartar, also of animals, as harts-horn, urine, salt Armoniack, & etc. for the expelling of most grievous, and desperate diseases. Now the aforesaid spirits have divers properties, the volatile spirits of salt, minerals, and metals have some, those of vegetables and animals have others; those have a sulphureous and fiery essence; these a mercurial, and aerial; wherefore they serve for different uses. In some diseases those sulphureous are preferred, but in others vegetable and animal, where also a consideration is to be had of the sickness, and bath it self, that one be not used for the other, to the great damage of the sick. For almost all natural baths, and volatile spirits of salts, minerals, and metals, partake of some most subtile, penetrating, heating, and drying sulphureous salt spirit; but the spirits of vegetables, and animals partake of a certain volatility that is most subtile, penetrating, heating, opening, cutting and attenuating, both urinous and nitrous, viz. contrary to the former; as appears by the pouring on of any volatile sulphureous spirit, as of common salt, vitriol, allome, minerals, and metals, upon the rectified spirit of Urine, or salt Armoniack: where presently the one mortifies the other, and takes away its volatility,

and subtilty: so that of both subtile spirits of divers natures there cometh a certain salt of no ódour and efficacy. Whence it is manifest that all spirits partaking of divers natures, and essences have not the same faculties, Therefore be thou cautious in giving most potent spirits, lest thou give an enemy instead of a friend, and learn their natures, virtues, and essences, before thou usest them in medicine. But thou dost ask, whether is that great force of those spirits gone as it were in a moment? Did it evaporate in that duel? No I say, but transmuted into a corporeal substance, for of a most pure, mineral, subtile, and most volatile sulphur, and a most penetrating animal MERCURY is made a certain corporeal salt, which is wonderful, and deserves to be called AQUILA PHILOSOPHORUM, because it is easily sublimed with a gentle heat, in which many things lye: for it doth not only conduce to the solution of metals, especially of gold, but also of it self by the power of maturation doth become a most efficacious medicine: Of which no more at this time, because I will not only advise the reader, that he be diligent in searching out the nature of spirits, which although they change their bodies, yet are not therefore to be called dead, but rather reduced to a better perfection. And let this suffice concerning the dryuse of baths in provoking sweat for the expelling of diseases: now for what diseases this or that spirit serves, thou shalt find in its proper Treatise, of which there hath been mention above, but in a word, know that those volatile sulphureous spirits of salts, minerals, and metals, are good in all obstructions of the inward parts, viz, of the spleen, lungs, and liver, but especially are most excellent in heating the cold nerves,

because they do most efficaciously beat, attenuate, cut, expel, and mundify, wherefore they are good in Contractures, Palsies, Epilepsy, Scurvy, Hypochondrical Melancholy, Morbus Gallicus, Itch, and other corrosive ulcers, and Fistulaes, & etc.

But the spirits of another kind, as of Tartar, Harts-horn, salt Armoniack, Urine, & etc. are hot also, but not so dry, and besides the heating virtue, have also a penetrating, cutting, mollifying, attenuating, absterging, and expelling power; wherefore also they work wonderfully in all obstructions of the inward and outward parts: for they do better than all others, open the pores of the skin, and provoke sweat, mollify, and open the hemorrhoides; provoke the MENSES of young and elder women, purge and heat the womb, and therefore cause fruitfulness; they heat and purge a cold and moist brain, acuate the intellect, and memory, let they that be great with child take heed of them, and also they that have a Porous open skin. Such and other more properties, and that deservedly are ascribed to these spirits. Now those two aforesaid baths (in one whereof those spirits are used in a humid way, being mixed with warm water, for the whole body to be bathed, and sweat in, but in the other in a dry way where the vapour's are by force of the fire made under the Globe, forced up into the sweating box towards the patient, which being used after this manner do oftentimes penetrate, and operate more efficaciously than the humid way) are not to be slighted for the recovery of health, as doing things incredible. Now those spirits not being found in shops, nor being made by any according to the manner that I have shewed in the second Part, I would have thee know that there

is yet another matter, which needs not to be distilled, and it is mineral; which being put into the Copper Instrument, doth of its own accord without fire yield such a sulphureous spirit, which penetrates very much, and goeth into the sweating box, like in all things to that which is made out of salts, minerals, and metals. Nature also hath provided us another matter that is to be found every where, which being In like manner put into the Instrument doth by it self, and of its own accord without fire yield a spirit, in virtue not unlike to that which is made out of crude Tartar, or salt Armoniack, Soot, Urine, & etc. Of which in the second Part, doing, viz, the same things with that which is made with costs and labours. Those foresaid two matters therefore can do the same things, which are required for a bath and sweating, which those two foresaid kinds of spirits, vim, mineral and sulphureous, vegetable and animal can do, & etc. Now what those two matters which are easily every where to be found are, thou desirest to know; but I dare not if I would, for the sake of the pious to reveal them because of the ungrateful, and unworthy. For it is an offence to cast pearl before swine, which yet the pious may, by the blessing of God find out by the reading of the rest of my Writings.

Now follows a wooden vessel which is to be used instead of a Cauldron in boiling of Beer, Metheglin, Vinegar, & etc.

Many things might be said concerning this matter, for although men may be found in any part of the world, who know how to make malt of corn,

and of this beer and vinegar; yet many things may be said of this matter for the correcting of it; but because it is not my purpose to shew such things now, yet I shall say something of the use of the copper globe which any one may provide instead of Caldron, and which is to be used with a certain wooden vessel in the boiling of beer, which by this way he may, as hath been spoken above concerning the operations, make as well as by the help of Caldrons. Moreover I could here also teach some other most profitable secrets, viz. (See Consola. of Seamen) how honey may be freed from its ungrateful odour, and taste by the help of precipitating; and how afterwards a most sweet spirit is to be drawn out of it very like in all things to the spirit of wine: also how the best and sweetest wine clear, and durable like to Mallago, may be made thence:

also how after purging it is to be crystallised, so as to resemble Sugar-candy in goodness and taste: also how the sweetness thereof may be converted into Tartar, very like to the natural: (See Explicat. Mirac. Mundi.) Also how out of fruits of trees, as cherries, apples, pears, & etc. a very good, and durable wine in goodness, colour, taste, and virtue, like to the natural, may be made; also how out of unripe grapes, that are not matured either by the inclemency of the country, or air, their acidity being changed into sweetness, a very good Wines like to the Rhenish may be made: also how out of sorrel, and other vegetables, a very good Tartar may be made, and that in a great quantity without much costs, resembling the Rhenish in colour, taste, and other virtues:

Also bow out of Corn, (whether malted, or ground in a Mill) a very good spirit is to be made, and also a very good vinegar like to the Rhenish;

also how out of Corn, (ground in a mill) or Meal, a very good spirit is to be distilled without any loss of the Meal, continuing yet fit to make bread. Such and more of this sort might be taught in this place, but because it is not good to divulge all things together, and at once, and this book would by this means grow bigger than I am willing it should, If such things should be here taught, I shall make an end of this Book (omitting other excellent possible secrets of nature) which although it be but little, yet will without doubt be profitable to many. And so Reader farewell.