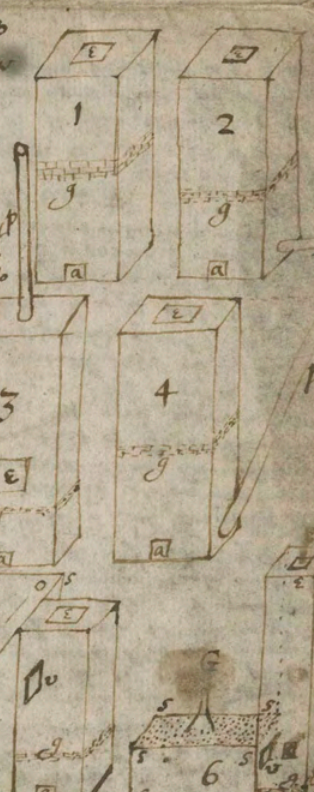


per
fastriemer

1st Furnace with flues it self by attracting the air through the ~~the~~ ashole a (fig 1, ~~2~~) or better through a pipe if
 well may be level if y^e furnace be above ground (fig 2) or perpendicular like a chimney on y^e top of y^e furnace to blow
 in above the coals (fig 3), or inclined to channel y^e air from y^e surface of y^e earth to y^e bottom of y^e fire if y^e furnace
 be within the earth (fig 4). ~~And the longer y^e pipe the better.~~ The grate g is usually made 2 or 3 foot high above the ashole or
 bottom of the furnace. And ~~at the top~~ must be a hole e to put in coals or charcoal, which must have a cover with a vent in or near it
 especially if you use pit coals. And these are useful for calcination, fusion, melting, exsiccation &c.
 2 Reverberatory furnace (fig 5) in which y^e hole e being stopped forces y^e flame of y^e wood on y^e grate g. to pass through
 y^e hole v of y^e partition wall into y^e archid. roof & return where it circulates, & is strongest, at its apex towards g. & further
 calcination, & of this sort are common even glass makers furnaces & Bilbunders, there being a hole with a plug in y^e side v to let out y^e metal into
 3 Distilling Furnace which differs only from y^e wind furnace in that y^e rebort must rest on a barr furnished a cross under which y^e
 fire is put in at y^e side, & y^e grate need not be so high above y^e ashole or bottom. The cover for y^e Top where y^e Rebort
 is put in must have one large or 4 smaller vents for y^e smoke, which are called Registers because by sloping y^e fire is abated & regulated.
 that it break not y^e glass by coming too suddenly for it. ~~And y^e matter requiring y^e glass to be distilled in~~ ^{to drive out y^e spirits too quickly} And this is used in distillations y^e require a strong fire.
 4 Sand furnace, ~~the vessel being placed in sand or~~ ^{when the matter requiring y^e glass to be distilled in} ~~or y^e less heat be required~~ in ashes, which must be sifted least y^e sand or
 the glass. The sand may be heated either all a side fire like y^e reverberatory furnace (fig 6) or with a fire underneath which must have
 9 or 10 inches at least to play in which y^e grate g is full of sand. And also 4 Registers rising up in y^e corners hind y^e pan & fur
 5 Balneum (or Balneum Marie) which ^{requiring yet less heat than the sand furnace} is set in hot water, which must be cold w^h y^e glass is put in or taken out lest it break it.
 6 Balneum Aoris or Vaporarium y^e vessel being hung in y^e frame of Boiling water, ^{well for distilling spirits} which is set in hot water, which must be cold w^h y^e glass is put in or taken out lest it break it.
 it is in horse dung, wheat bran, brewers grains, saw dust, clopt hay or straw, all well at little moistened in good quantities & well pressed together
 & covered from y^e cold air contract & keep heat for some time. Some set their matter to be digested in an egg shell under a hen
 7 Alkanor (Piger Hemicus, furus Medice) to make a constant & equal heat for a long time, distillations though for a year or
 more. The vessel is placed in sand or ashes, to heat w^h there is a Turrit e.g. (fig 6) ^{kindled at the bottom} and charcoal kindled at the
 bottom. ^{which must grow wider towards y^e bottom tapering, y^e little coals may readily fall down}
 into y^e place of those y^e are consumed, & it must be close covered at the top (by lute or otherwise) least y^e coals be all
 kindled at once & that y^e heat may be forced through y^e vent hole v into the sand &c. &c. To this may be referred y^e
 Lamp Furnace when the sand is heated by a lamp burning underneath.
 These Furnaces are made either of fire stone or burnt bricks, some use bricks before they be hard dried that they
 may at pleasure be easily cut. And y^e lute for these Furnaces is made of Tobacco Pipe clay & Horsemans will be a good material



- Bolt Head shaped like a bolt, wth a Globular Bottom & long stem.
 2 Egg Glasses from y^e shape of their Bolt with a long stem
 7 Separating Glasses to separate oyle from aqueous liquors or one coloured liquor from another
 Cones of Iron or Brasse to pour melted metalline substances into. For y^e most ph^{se} a mortar will serve instead of them
 Cucurbits, from their shape, commonly call'd boddys in relation to their heads, used in sand ashes or Balneo for Distillation or Sublimation
 Heads to be set over y^e boddys, wth a Pipe if for Distillation; but wth out a Pipe if for Digestion, & then call'd blind heads
 Retorts from their figure used for Distillations in sand or naked fire.
 Stills because y^e hollow is shallow like that of a shell & not deep like y^e of a Crucible used for separating y^e Baser Metalls from Gold & Silver
 Crucibles (5 or 6 one wth in another are call'd a nest) for fusion Calcination &c: These are well burnt & sound y^t will ring if you fill y^e on them.
 Ash. Bellows; Tongues; Spatulas; Cincels or rings of iron for casting Glasse; Marble & Muller for Grinding.

Vapour, w^{ch} a matter being in thin plates hung over the vapour of some corroding substance. Thus a over vinegar becomes Azure or white feds & so. 24. The
 2nd ♀ put into a shape of husks of Grapes (made to send forth some vapour by easy heat) is corroded by their warmth & acid steams into Viridigrase
 (Amalgamation, when a Metalline body is so mixed with ♀ that they both become one similar body or part. That they may add y^e sooner y^e metall must be in thin
 plates or filings, & they must be made to work one upon another by heat, w^{ch} will usually be done in a Iron or marble mortar heated with Bayling water. & mixed
 more readily with 24 yⁿ O. 12, D. 2, ♀. 1. If y^e ♀ be evaporated y^e Metall remains in a fine Calx. You may use any proportion but 2 & 10 of ♀ is one of y^e best
 To build on D or ♀, leach y^e or 6 pls of ♀ in a Crucible till it smokes, yⁿ put in one pls of O & presently pour out the add into Edd water, yⁿ lay it
 in a wooden dish set inclining that y^e sublimy of ♀ may run from y^e add. This done, lightly wipe over y^e D or ♀ with ♀, then rub it over with y^e add till it all
 looks white, yⁿ lay it on a few live charcoals to evaporate y^e Mercury & the O will be left on y^e metall of a faint yellow colour, & is brought to its true lustre being rubb
 over with a scratch brush it is a bundle of very small iron wires.
 Abstracting the solvent water. Thus ♀ dissolved in V or y^e V abstracted by Evaporation or Distillation, is left in a red powder called precipitate. ♀ dissolved in oo of O
 by abstraction becomes a white powder w^{ch} turns yellow by dulcoration wth water called Turbith Minerale. ♀, minimum, or Lithargy, dissolved in distilled vinegar
 by abstraction gives a white salt or rather violiol of Lead called Saccarum Saturne because sweet. And all metalls are reduced to calx by dissolution in
 their proper menstruums or abstractions. Note y^t any solvent is called a Menstruum because a perfect solution of some body requires a Philosophicall month y^t is 40 days.
 Precipi- If y^e solvent y^e solvent not wholly but only till you see a thin cubicle or skum on y^e top of y^e it, like y^t on boggy waters (w^{ch} usually happens when there
 remains about 4 pls of liquor to one of the body). & then set it for some time in a cold cellar ~~in a cold~~ it will shake into chancel or fine bound of small

hard to bee separated from y^e power. Also distilled waters of Iron &c.
Comentation when some metalline body is brought to a Calx by stratification wth salts etc. Thus ♂ & ♀ are brought into a Calx being in thin plates co-
mented wth any of those bodys w^{ch} yield acid salt spirits or w^{ch} quick lime moistend into past wth □, &c Common comment is made of brick dust, O, P, Q,
verdigrise (& this stratified wth coarse O or D refineth y^m By carrying away all other metals in fumes). If to common comment be added * its called royall flr it distroys
all mettals but O. Having filled a Crucible wth platez of mettall infused wth Comment strait sap^r shaven, y^e* Comment lying highest & lowest, fit another piece
bot to it mouth to mouth wth a hole in y^e bottom for y^e fumoz to fly out & set y^m in a furnace 12 or 24 X's togither or more; blowing y^e mettall melt
not. Comenting is useful to graduat mettalls (ie exalte their colour) thus Diges a golden colour being consaid wth Subia Romana. Per & Q is blanchifed (ie whitnd) by a paste of Soap &
Communion, when some powders are mixed wth y^e body to bee calcined. This ♂ Diaphoreticum is made of egmalt pte of ♂ & O put into a g d hot Churne
in a little at once, when all is in make them flow togther $\frac{1}{4}$ of S, dulcify, mix y^e powder againe wth O, flux, Dulcity, & repeat this till it bee a white pouder.
It may bee also made of Regulus ♂ Crocus Metallorum is made of ♂ & O ana will dryd if mixed, fired in a mortar wth a coal, & dulcorid. Its used in vomits
infused in whiter wine). Regulus ♂ of ♂, O, & P put by spoonfulls into a red hat crucible when all is in make them flow togther, take it off & when tis cold in y^e Cru-
cible you will find y^e black ☐ on y^e lop wth fixed salts of a metalline pte below like lead bat clear brittle call'd Reg. ♂; of this Cups are made. It upon one
pte of Iron heated which hold in a Crucible you cast 2 pts of ♂ & mell y^e or well togther with a little O to promote th fusion you will have Regulus Martis in the
bottom w^{ch} if melted againe 3 or 4 times wth O is purifyd & bring col both an upper surface under y^e O w^{ch} is of a cleer Amber colour, y^e figure y^e* & Reg. ♂ still
One pound of O kept some while in fusion & $\frac{1}{8}$ of ☐ thrown in y^e quantity of a harte nut-at-once (wth burning carry away stit y^e ♀ of the O) is Sal Prunella.

1. Of Flowers called Sublimation, y^e subtil p^{ts} arising by the force of fire in a dry forme. Thus Flowers of $\frac{\square}{\square}$ are made, by mixing well powdered $\frac{\square}{\square}$ with Colcothar, or $\frac{\square}{\square}$, or brief
rust or (wel is best) wthout any addition, they are yellow. Of $\frac{\square}{\square}$ p^{se} in naked fire y^e highest flowers are white y^e rest landing to red. ~~(wel is made of. [Soot, Salt])~~ subliming from
 $\frac{\square}{\square}$ or scales of $\frac{\square}{\square}$, in Sand. Benzein set in any gally pott^{le} on a few coals sublimes into white flowers wel may be received ~~in a sheet of paper folded comen~~
wth * in sand sublimes into red flowers. $\frac{\square}{\square}$ well mixed wth $\frac{\square}{\square}$ (calcined brist white & red) & $\frac{\square}{\square}$ decapitated (y^e is calcined till it have cracking) sublimes in sand to a white
corrosive salt called $\frac{\square}{\square}$ wel is nothing but y^e joynt wth y^e spirits of y^e salts in a dry forme. Crude $\frac{\square}{\square}$ & $\frac{\square}{\square}$ will mixed & sublime into a body more hard & bristell
y^e $\frac{\square}{\square}$ is not corrosive called $\frac{\square}{\square}$ dulcis. ~~Benzein~~ * sublimed from dulcified Colcothar is Ess Venusis. $\frac{\square}{\square}$ & $\frac{\square}{\square}$ into Cinabar & Vermilion. ~~the rest of the~~ 12 melt
by a violent fire ~~emits~~ flowers called discharge wth if white is charge of $\frac{\square}{\square}$, if yellow of $\frac{\square}{\square}$; & they are y^e same but y^e yellow is most burnt. ~~Most of~~ ^{Some} sublimations
are usually made in boddys ~~that~~ & heads wth a hole in the top for y^e moisture (of w^{ch} there is commonly some) ~~all~~ ^{must be stopp'd} to pass away, is
the dry fumes begin to rise, w^{ch} you may know by a peice of Glasse layd over the hole. You may let the body stand open till y^e most fumes be gone & then let it be
head, but the flowers of somethings (as y^e simple flowers of $\frac{\square}{\square}$, 12, 21, Reg^o $\frac{\square}{\square}$ & $\frac{\square}{\square}$) will not rise wthout a vent above for fresh air to get in & some flowers to
get out. Sometimes Sublimations are made wth several potts open at both ends y^e y^e neck of one may be put into another.

2. Of Vapours called Distillation, y^e volatile p^{ts} being forced up by fire into vapors w^{ch} condense into a liquor. Thus in y^e Animal Kingdom: Mans blood y^elows
an urinous spirit, black oo, stinking flegme & some fixed salt. Purified blood y^elows y^e spirit first, fresh blood not till all y^e serum be drawn off; there wth you
use fresh blood cast away the serum. Mans $\frac{\square}{\square}$ also if fresh yields y^e spirit last, if putrified first: y^e remainder by solution, filtration &c. gives a white salt. Fresh
 $\frac{\square}{\square}$ put upon Calx vive yields y^e spirit first. Most p^{ts} of animall yield by distillation an urinous spirit (as Ox Gall, Rennet baggs, Shrews humanum, y^e stone of y^e
Bladder, Kernes, hoofs hawc &c). Harb korne in Sand yields urinous spirit, volatil salt, stinking oo, & flegme. * y^elows its urinous spirit if distilled from Calx vive
or salt of $\frac{\square}{\square}$ or lapis Calaminaris, for they laying hold on y^e $\frac{\square}{\square}$ let loose y^e urinous spirit. In y^e Vegetable Kingdom: Woods in a Retort in naked fire yield an acid
spirit & fixed salt, & most of y^e man oyle too especially of heavy, as box-woode. Dry hearts & brimsticke drugs: distilled in great quantites in a Vessica wth a great proportion (as 3 to 1)
of water y^elows an oyle w^{ch} after some days standing still will separate it selfe from y^e water where wth it must either rising a top to be scum'd off, or sinking to y^e bottom as oo of Cinna-
mon, & most other East India drugs doe: These are call'd Ethereal oyles. After y^e oo is separated if you distill y^e water againe it yields a good spirit having in it all y^e remainder of the oyle
All vegetable juices (as of grapes apples &c) & all extractions or decoctions wth water (as of Maull Barley Potatoes &c) will ferment some of themselves y^e rest by addition of y^e
& y^e they yield an Oyle vive or burning spirit w^{ch} comes of first & then y^e flegme. The longer y^e wine boyle &c are kept, so y^e they be not sourd, y^e more they are ripen'd
& yield y^e more spirit. All vegetable burning spirits are of y^e same nature wth spirit of wine & may be used instead thereof. Vingar in BM yields first about
 $\frac{1}{4}$ or $\frac{1}{3}$ of it in flegme (wel cast away) y^e rest is then its spirit call'd Cleechem Distillatum. $\frac{\square}{\square}$ yields a very little spirit more flegme, very much fald oo, & a fixed salt.
~~Wood = Soot~~ Wood = Soot yields an urinous spirit, yellow oo, & very volatile white salt. Tobacco in naked fire a black oo, urinous spirit, stinking flegme, & fixed salt. Turpentine a flagrant & clear
oo wth some addition it comes over in red fumes but settles into a colourless liquor. $\frac{\square}{\square}$ from one pt of $\frac{\square}{\square}$ mixed wth 2 pbs of $\frac{\square}{\square}$ (calcined to white), it differs very little from spirit of $\frac{\square}{\square}$
for y^e $\frac{\square}{\square}$ yields little or nothing but is only added to keep y^e $\frac{\square}{\square}$ from flaming; for $\frac{\square}{\square}$ & $\frac{\square}{\square}$ yield no spirit while they are in flame. $\frac{\square}{\square}$ from a dissolution of * or $\frac{\square}{\square}$ in $\frac{\square}{\square}$ oo of
 $\frac{\square}{\square}$ calcined for feare of boiling over when it melts emits a white fume condensing into y^e red oo of $\frac{\square}{\square}$. I blame after much flegm gives a white fume condensing into
an acid spirit. $\frac{\square}{\square}$ except it flame (w^{ch} it cannot doe in close vessels) yields not its spirit but flowers, therefore is fixed in a Crucible & glass dish standing under a call
oyle of $\frac{\square}{\square}$ & campanam. Butter of $\frac{\square}{\square}$ is made of $\frac{\square}{\square}$ & $\frac{\square}{\square}$ distill'd in naked fire, it goes into y^e receiver in liquor & some sticks in y^e neck of the retort like butter. Amber
per se yields spirit, oo, & volatile salt. Verdigrise yields an acid spirit but not so strong as $\frac{\square}{\square}$.