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Craft and Science in the Early Modern World
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**Three Recipes from BnF Ms Fr 640
and Related Recipes from Other Sources**

1. Excellent Mustard, p048r

French transcription

Excellente moustarde

Fais seicher du pain au four puys le larde de girofle & Canelle & ainsy mects le tremper dans de bon vin Puys passe tout par lestamine estant bien pile & lincorpore avecq ta graine de moustarde.

English Translation

Excellent mustard

Dry some bread in an oven, then stick cloves & cinnamon into it and put it to soak in good wine. Then, being well crushed, pass everything through a cloth strainer and incorporate it with your mustard seeds.

Related recipes in the manuscript

“And stir it with your palette so that it all becomes like a thick sauce or light mustard.” (121v casting in silver)

“...then apply a thick coat (as thick as mustard or a little bit thicker) over the medal...” (89v white glassmakers’ sand mixed with ammonia salt)

“...adjust it with such attentiveness that, while mixing it vigorously and wetting it quickly with a wooden spoon, it does not become thicker than mustard...” (113v sand casting)

How can we make our mustard taste better?

“Sulphur oil bites and is corrosive, but it is softens by the clove oil [lhuile] and rose honey.” (46r for the teeth, some sulphur oil)

“It is true that it has a bad smell but you can add some rosat honey and cinnamon or clove oil.” (47r for teeth)

“When the wine is enough burned, heat it a bit more and add a few cloves and enough sugar.” (71r sweet and burned wine)

Related recipes in other manuscripts

From the *Dutch Eenen Nyeuwen Coock Boeck* (1560), written by Gheeraert Vorselman and translated by Lord Floris van Montfort (G.A. van heusden) of the Shire of Polderslot

Om drooghen mostaerd te maken.opt Rooms

Droocht nieuwe mostaertsæt in die heete sonne oft oven oft bijden viere, ende stoot dat in eenen vijsere tot cleynnen mele, ende maeckt hier af een deech met stercken azijn ende een cleyn luttel greynpoeders ende laet dan dat tot eenen stuck ligghen drooghen.

To make dry mustard in the Roman way

Dry new mustard seed in the hot sun or in the oven or at the fire, and crush it in a mortar to fine flour and make a dough with this and with strong vinegar and a little **grain powder** and let dry to one piece.

Anderen mostaert opt Rooms,wit

Neemt mostaertsæt ende legget twee daghen in water te weycke, ende veranderet water dicwil, so sal hi te witter ende beter zijn ende stootten oft wrijften wel cleyne. Dan doeter toe amandelen cleyne ghestooten, ende wrijvet weder tesamen met witbroot dat geweyct is; dan doeget samen door met stercken azijn oft verjus. Wildien sterc hebben, doeter stercke specerie in, wildien soet hebben, doeter soet in.

Different mustard the Roman way, white

Take mustard seed and lay it two days to soak in water, and change the water often, so it will be whiter and better and crush them small. Then add almonds crushed small and rub it together with **whitebread** that has soaked; then mix it with strong vinegar or verjuice. IF you want it strong, add strong spices, and if you want it sweet, add sweet.

Delights for Ladies - Cookerie and Huswifery, Hugh Plat, 1609

Mustard Meale

It is usuall in Venice to sell the meal of Mustard in their markets as we doe flower and meale in England: this meale, by the addition of vinegar, in two or three daies becommeth exceeding good mustard: but it would be much stronger and finer, **if the husks or huls were first divided by searce or boulder**: which may easily be done, if you dry your seeds against the fire before you grinde them. The Dutch iron hand-mills or an ordinarie pepper-mill may serve for this purpose.

The Closet of the Eminently Learned, Sir Kenelme Digby, Kt Opened. 1669, provides two recipes for making mustard.

To make Mustar

The best way of making Mustard is this: Take of the best Mustard-seed (which is black) for example, a quart. Dry it gently in an Oven, and beat it to a **subtle powder, and searse it**. Then mingle well strong Wine-vinegar with it, so much that it be pretty liquid, for it will dry with

keeping. Put to this a little Pepper beaten small (white is the best) at discretion, as about a good pugil, and put a **good spoonful of Sugar** to it (which is not to make it taste sweet, but rather quick, and to help the fermentation) lay a good Onion in the bottom, quartered if you will, and a race of Ginger scraped and bruised; and stir it often with an Horseradish root cleansed, which let always lie in the pot till it have lost its virtue, then take a new one. This will keep long, and grow better for a while. It is not good till after a month, that it hath fermented a while. Some think it will be the quicker, if the seed be ground with fair water, instead of Vinegar, putting store of Onions in it.

My lady Holmeby makes her quick fine Mustard thus: Choose true Mustard-seed; dry it in an Oven after the bread is out. Beat and searse it to a most subtle powder. Mingle Sherry-sack with it (stirring it a long time very well, so much as to have it of a fit consistence for Mustard. Then put a good quantity of fine Sugar to it, as five or six spoonfuls, or more, to a pint of Mustard. Stir and incorporate all well together. This will keep good a long time. Some do like to put to it a little (but a little) of very sharp Wine-vinegar.

Consistency: *Dutch Eenen Nyeuwen Coock Boeck* (1560) mentioned adding white bread and grains. So the starches added the consistency.

2. Perfumer, p163r

French transcription

Parfumeur

Ils mectent volontiers moitie dambre et moictie musc et fort peu de civette pource que lambre emporte toujours la principale senteur sur le musc

Pour espargner lambre ils mectent volontiers aux couches blanches un peu de musc et qui donne senteur plus violente Mays pour oster ou cacher la noirceur du musc Ils y metent un peu damydon dangleterre qui est parfaitement blanc

Pour parfumer dambre blanc a la facon de Portugal prens un huchau dambre bien esmenuisse Et ayant mis dans une petite escuelle dargent une cuillere dhuille de fleur ou en defaut dhuille de (bien, lin) Scavoir est une cuillere dargent quon sert a table Mect y ton ambre gris et pose tout sur feu lent et ils se fendra bien tost si lambre est bon et ny demeurera rien grumeleux Estant le tout fondu mect y la grosseur. dun pinon de civette et fais fondre et mesle bien ensemble apres prens tes gands bien laves et bien essuict et trempant fort legerement le bout du doigt dans le bor de lhuile estant sur le gand peu a peu et avec patience et frotte le gand entre les mains et suis

les doigts et les costures lune apres lautre Et laisse seicher Apres rescuit comme devant jusque a ce que lambre soit tou pose

English Translation

Perfumer

They make their perfumes with half amber and half musk, and just a small quantity of excrement of civet-cat, because the scent of amber is stronger than the scent of musk

To spare amber, perfumers add a small quantity of musk to the white lines, in order to get a stronger scent. They add a bit of starch from England, which is perfectly white, to hide or remove the blackness of musc.

If you want to perfume with white amber, as do Portuguese people, take a platter of amber well [...] Put a spoon of flower oil, or, if not possible, linseed oil in a small silver platter

Pour your grey amber in a common silver spoon, then place it on a low fire, if your amber is of good quality the mixture melts without being lumpy. When the mixture is melted add a grain of chive, melt and blent together, then take some very clean and dry gloves, dip the end of your finger in the mixture, then very patiently rub the glove between your hands, do not forget to rub one after another fingers and seams. Then let the mixture dry. Repeat the heating process until all the amber is coated.

Working translation

Perfumer

They make their perfumes with half amber and half musk, and just a small quantity of excrement of civet-cat, because the scent of amber is stronger than the scent of musk

To spare amber, they add a small quantity of musk to the white lines[layers], in order to get a stronger scent. But to hide or remove the blackness of musc, they add a bit of starch from England, which is perfectly white.

[Quand l'ambre?]

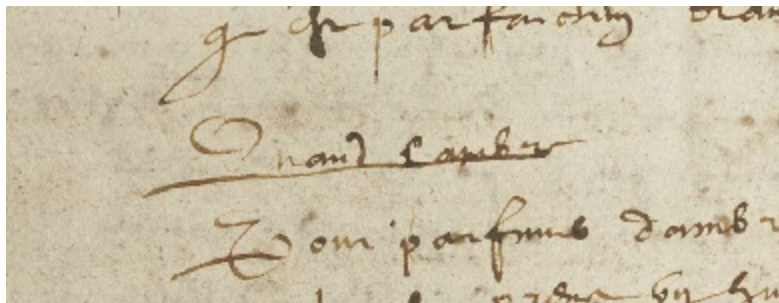
To perfume white amber in the Portuguese way take a platter of amber well [...] and having put in a small silver platter a spoon of flower oil, or, if not possible, linseed oil

Pour your grey amber in a common silver spoon, then place it all on a low fire, if your amber is of good quality the mixture melts without being lumpy. When the mixture is melted add a grain of chive, melt and blent together, then take some very clean and dry gloves, dip the end of your finger in the mixture, then very patiently rub the glove between your hands, do not forget to rub

one after another fingers and seams. Then let the mixture dry. Repeat the heating process until all the amber is coated.

Questions on the transcription/translation

What does this say? “Quand l’ambre”? The first letter corresponds to “O” in the “LETTERFORMS” document. It would also correspond to “Q” if the line below were considered part of the letter. These two(?) words appear between the 2nd and 3rd paragraphs of this recipe and are not in the transcription/translation.



Other related recipes from MS.

p044v Excellent water against the rage by the master de montorsin

Use of perfume: perfume is sprayed over clothes

“...you will [...] the steam and you will **perfume** also your clothes. This is a very rare and proved secret.”

p037v Yellow amber

YELLOW AMBER

You can cut it with a file, then you use some powdered salt on it called by the English desramonet, but I think that it is powdered pumice stone for its sandy asperity and with a tightened thread, he was polishing its amber then using some Tripoli from Brittany with his finger, another one with some leather or a stick. If some unhealthy person wears some amber, it loses its colour and turns white. But to mend it, you have to dip it for one night in some urine and make it boil in it for a while.

p038r Amber

How to changed the color of **amber**...

The orange colour which is typical of the transparent amber and of the thick one is not in depth for it is white inside. But commensurate with age or after being worn it gets a ginger crust. That is why who cuts it with a file or on a wheel doesn't take this crust off when possible but only polish it by rubbing it with a willow or other soft wood stick, dip it on some water, spread some

Britanny tripoli and it is beautifully polished. If it is too straw yellow and you want to darken its colour, hang it in a fireplace where it is in contact with soot and steam And it will turn to a ginger orange color. Try to have the more white transparent and leave turn into green under some muck? As for bones or make them smoke in a close place with some safre or manganese and other drugs that you know or in some urine and distilled vinegar, mingle it with some colours or with some very boiling water steam in some copper or boiling water with some silver and ammonium salt. Some cut faceted amber on a soft wood wheel with some brass instead of emrod and jet black also. Salt that the English call armonic is mineral salt which seems like marble stone and is mineral is very strong when in large pieces like the Ardonne and Montserrat one.

I tried to boil it in some lexive or some biting water and turn ginger on its surface, and if it is rubbed against soft pine wood rather than cold [...], it can be cut easily.

p101v **Varnish**

The Germans boil the **minium** intently in **linen oil**, and to make it as thick as **varnish**, they mix it with heavily pulverized yellow **amber**. (maybe used as a kind of coloration and to add consistency?)

Musk-related recipe

p015v EARS

When some defluxion occurs, make sure of putting nothing in it, and according to the saying to the eye and to the ear, touch it just gently. If the ear is infected however, it is good to apply some musky cotton which means mixed with some musk for it calms down.

musk for you to calm down

p058v Brushes

When the color has dried inside them and that you want to clean them, soak them in some aspic oil and they will turn immediately soft again as before, then you will finish to clean them in some nut oil. Nut oil is not as appropriate to soften them as the aspic one which is clear like water and penetrates and is not as thick as the nut oil. Brush handles are made by the quirky ones of porcupine hairs, by some others of Turkish arrow [...] wood with which they make also small sticks to rest their hand when they are painting.

Choose always the thinnest one.

To work properly on small scale, you need some very fine brushes with a strong point and because the [...] hair is [...], the quickest one use the older rats beards and even [...] if they can

find some and put two or three in the middle of a brush. These brushes draw a straight line like a quill and all the other hairs stick to them. [...] Hair and of other animals used to make some musk are even better for just one hair is necessary in a brush.

Related Recipes in other manuscripts

Notandissimi secreti de l'arte profumatoria, per far ogli, acque, paste, balle, moscardini, uccelletti, paternostri, et tutta l'arte intiera, come si ricerca, cosi nella città di Napoli del Reame, come in Roma, e quini in la città di Vinegia nuovamente ristampati

Rosetti, Gioanventura, active 1530-1548.

Rampazetto, Francesco, active 1540-1576.

Venetia: Appresso Francesco Rampazetto, 1560.

Google Books:

<http://books.google.com/books?id=-LTT7FQZNSIC&pg=PT171#v=onepage&q=mostarda&f=false>

Wellcome Library:

<http://eeb.chadwyck.co.uk/search/displayThumbnails.do?ItemID=hin-wel-all-00002533-001&DurUrl=Yes>

A fare muschio soluto per ogni opera (*Notandissimi secreti*, 10-11):

A fare muschio soluto per ogni opera.

PIGLIATE quanto muschio che a uoi pare, et calcate lo nel mortalletto pianamente che sia di brozo, et mettetegli uno gioccio d'acqua rosa, et mescolate in modo che uenghi uno unguento, & sia ben macinato, & gittateli de l'altra acqua rosa a poco a poco, in modo che facciate un'acqua negra, laquale si chiama muschio soluto, e tanto piu potrete gioger de l'acqua quanto sera la materia doue operareti, & infusione d'ogni cosa odorifera, è da intendere de la infusione ho ditto di sopra di sandali ouer di altro, e di tutte le cose aromatiche si puo fare infusione, cioè traher de la sostanza & odori. E notati se tolleti buona acqua di uita che sia perfetta in un'ampolla di uetro quanto ui piace, et in quella metteteli sandali o canlla o altra specie che ui piace, e sia trita, e lasciatela cosi a moglie per cinque giorni, & l'ampolla uuol star ben serrata, poi scolati l'acqua pian piano, si che uenghi netta quando la uorrete metter in opera, & scolatila chiara, e con quest'acqua si debbe operar con gran diligentia, perche l'ha hauuta in se tutta la uirtu, & odore de la cosa che le sta infusa, o garofali o muschio o canella, o quello che li ponesti dentro. Per tanto operando gli hauereti quella custodia, ch'a uoi parera nel sparagno; & accio che sappiate se ponereti del muschio ne l'acqua di uita, et che l'acqua stia ben astroppata, quantunque la si addimanda infusione di muschio si potrà ancho chiamar muschio soluto, per-

DE L'ARTE PROFVMATORIA II
che uoi mettereti uno goccio di quell'acqua di uita in un boc-
cale di uino bianco dolce, & lo fareti diuentar moscatello, &
similmente se di quest'acqua mettereti in un barile uuoto, &
poi mettereti il uino, sempre sentireti del moscatello, & è tan-
to possente quest'acqua se uoi ne mettereti un gioccio in una
inghystara uuota gran tempo il uino che li mettereti sapera
di moscatello. Però è da consider ar la sua natura che questa
preciosa acqua la potreti adoprare in tutte le cose, doue e mus-
schio soluto, o ne li saponetti, o doue a uoi piacerà, o sapone, o
uccelletti, o ne l'oldano, & ne l'altre cose che per breuità non
si scriuono.

A conoscere il muschio, quale è buono, & qual non è (Notandissimi secreti, 69-70):

A conoscere il muschio, quale è buono,
& qual non è.
PRIMA pigliate il muschio, & ponetilo sopra la bra-

DE L'ARTE PROFVMATORIA 70
sa del fuoco, & se l'andara in oglio andara uia, & restara
una pelletta come tela di ragno sopra le bronze, quello sarà il
buon muschio, laqual tela uuole esser gonfia, & releuata, &
se l'restara a modo di calcina grossa in massa l'è falso, & quel
muschio che rosseggia si è il buono, et che tiene del negro, e che
rompendolo sia lustro dico del rosetto, che rompendolo trahe
al rosetto dentro, e tutti gli altri colori falsi sono.

Una concia da guanti odorifera (Notandissimi secreti, 69-70):

cosa gentile. Vna concia da guanti odorifera.
HABBIATE li uostri guanti di caprone, o uitello, o capriolo, & imbeueteli ne l'acqua nansa, & lasciate li stare per tre giorni, e tre notti, & dappoi fate che habbiate grasso di redicello di capretto tepido, & fate che habbiate muschio, ambracane, & zibetto, & poneti ogni cosa in oglio di hen, & cō la spongia ongete li guanti dentro, & di fuori, & per ogni uerso, & se li uorreti poner legno aloe in polucre e zuccaro sarà signorile.

Una concia da guanti (*Notandissimi secreti*, 46):

Vna concia da guanti.
PIGLIATE li uostri guanti bagnati dentro, & di fuori di acqua rosata, & struccateli, & calcateli, in mano: et maneggiateli uno poco tanto che siano mezi asciutti, et acconciateli con queste cose, & dipoi pigliate grasso purgato, & eletto, & così caldo ongeteli con spongia, et calcateli un'altra uolta, e teneteli in mano un'altro pezzo, et poi cauateli et pigliate oglio di storax, zibetto, ambracane, & muschio, et incorporati & ongeti li guanti, & si dentro come di fuori fregandoli, accioche riceua le sopraditte cose, fregando l'uno con l'altro, & così si affineranno, & riceueranno l'odore mirabile.

Una composizione ottima di ambra (*Notandissimi secreti*, 43-44):

Vna compositione ottima di ambra.
PIGLIATE chiare de oui tante, che siano una lira, &

DE L'ARTE PROFVMATORIA 44
sbattetele benissimo, & fregateui con la uostra spongia tanto
che facciate un'acqua chiara, & dipoi tollete doi terzi di uer
nice, & mastici oncia una, & una parte di gomma arabica,
zaffaran quanto ui basta, & quanto fara necessario piu e ma
co tanto che li dia colore, e pestate ogni cosa da per se, e met
teteli nella chiara de oui, et ponerete poi tutto insieme in una
bozza coperta con una pezza di lino, et farete bollir per cin
que hore, & dipoi che fara bollito ponete ditta bozza in ac
qua fredda & cauate fuori quello che sarà al fondo, & gitta
telo ne l'oglio di lino freddo, et fara lambra che uoleti, di pri
ma fate che lo mettiate al Sole per tre hore, ouero per uno
mezo giorno.

Concia da guanti (*Notandissimi secreti*, 44):

SECRETI NUOVI
Concia da guanti Tutti questi ogli metteti in
Pigliate oglio di spico manco sieme in una ampolleta, &
de tutto. con una spongia ongeti gli
Di belzoi guanti, & con l'acqua ro
Di storax sata sbrofateli, cosa bella,
Di gelsomini et se uolleti mistura tolleti
Di moschette muschio, ambracane, zibet
Di nose muschiate to, et un poco d'olio di bet.
Di naranze
Di garofali

A purgar l'oglio di lino (*Notandissimi secreti*, 38-39):

A purgar l'oglio di lino.
PIGLIATE oglio de lino lira una, acqua communa li-
re doi, & metteti ogni cosa in una inghystara, & sbatteti ben
con quella inghystara, tãto che rompeti l'oglio, et insieme t'ac-
qua, et dipoi habbiati lume di rocca oncie doi, minio oncie tre
& pestati ogni cosa insieme ben sottilmente, & dipoi metteti
ne la ditta inghystara, e tornati ben a mescolare anchor come
prima, & dipoi mescolato stroppati bene che la nõ respiri, et
mettetila al Sole, et lasciatila star per giorni uinticinque ouer.

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DE L'ARTE PROFVMATORIA 39
trenta, mutando l'acqua ogni mattina mescolando ben come
ho ditto di sopra & sarà purgato.

Una mirabilissima concia de guanti odorifera & non vulgareggiata (*Notandissimi secreti*, 29):

Vna mirabilissima concia de guanti odorife-
ra & non uulgareggiata.
Pigliate oglio di spico manco E tutte le anteditte cose met-
de tutti. teti insieme in una ampolla,
Di belzoi con zibetto. et con una spongia ongeti li
Di storax con muschio. guanti, & poi sbroffatili cõ
Di gelsamino con am- un pugno d'acqua rosata.
bracane, aña.
Di moschetta con legno
aloe.
Di nose muschiate con
canella.
Di naranze, & de ga-
rosali.

“ambracane” etymology <http://www.etimo.it/?term=ambracane> :

ambracàne dal *b. lat.* AMBRUM CANUM
ambra bianca (v. *Ambra e Canizie*). — Am-
bra odorifera, la quale sembra esser lo
stesso che l'ambra bianca o grigia, a dif-
ferenza della gialla.

So is this *ambergris*?!

Hugh Plat, *Delightes for ladies to adorne their persons, tables, closets, and distillatories with beauties, banquets, perfumes and waters.* 1602

34. Diuers excellent sentes for gloues, with their proportions and other cir|cumstances, with the manner of perfuming.

The Violet, the Orange, the Lemmon duely proportioned with other sentes, performe this well, so likewise of Labdanum, Storax, Beniamin. &c.

The manner is this. First lay your amber vpon a few coales till it begin to cracke like lime, then let it coole of it selfe, taking away the coales, then grinde the same with some yellowe ocre, till you perceiue a right color for a gloue: with this mixture wash ouer your gloue with a little haire|brush vpon a smooth stone in euerie seame and all ouer, then hang your gloues to drie vppon a line, then with gum Dragagant dissolued in some Rosewater, & ground with a little oyle de Ben, or of sweet Almonds vpo~ a stone, strike ouer your gloues in euerie place with the gum and oyle so ground together, doe this with a little sponge, but bee sure the gloues be first throughly dry, and the col|our well rubbed and beaten out of the gloue; then let them hange againe till they be drie, which will be in a short time. Then if you will haue your gloue to lie smooth and faire in shewe, goe ouer it againe with your sponge, and the mix|ture of gumme and oyle, and drie the gloue yet once againe. **Then grinde vppon your stone two or three graines of good muske**, with halfe a spoonefull of Rosewater, and with a verie little peece of a sponge take vp the composition by a little and little, and so lay it vpon your gloue lying vppon the stone. Picke and straine your gum Dragagant before you vse it. Perfume but the one side of your gloue at once, and then hang it vp to drie, and then finish the other side. Tenne graines of muske wil giue a sufficient perfume to eight paire of gloues. Note also that this perfume is done vpon a thin Lambes leather gloue, and if you worke vpon a kids skin or goates skin, which is vsuall leather for rich perfumes, the~ you must adde more quantitie of the oyle of Ben to your gumme, and go ouer the gloue twice therewith.

--- image 94

“But now my pen and paper are perfum'd”

--- image 3

25. To draw both good Rosewater, and oyle of Roses together.

After you haue digested your Rose leaues by the speace of 3. moneths, *sicut ante, num. 13.*
eyther in barrels or hookers, then distill the~ with faire water in a limbeck, draw so long as you
finde anie excellent smell of the Rose, then diluide the fatty oyle that fleeteth on the top of the
Rose water, and so you haue both excellent oyle of Roses, and also good Rosewater together, and
you shall also haue more water then by the ordinarie
way, and this Rosewater extendeth farther in physicall compositions, and the other serueth best
for **perfumes and casting bottles**. You may also distill the oyle of *Li num Rhodtum* this way,
saying that you shall not neede to mace|rate the same about 24 houres in your water or
menstruum before you distill: this oyle hath a most pleasing smell in a manner equall with the
oyle of Roses.

---image 61

31. A present and delicate perfume.

Lay two or three droppes of **liquid Amber** vpon a glowing coale, or a peece of lignum aloes,
lignum Rhodium, or storax.

--image 92

*****excrement of civet-cat: It is not the poo-poo!! It should be the scent produced by the anal
glands of large Indian civets (*Viverra zibetha*)!!!! It was used as scent and medicine in China!!**

http://en.wikipedia.org/wiki/Large_Indian_civet

This perfume recipe is another collection of crazy, strong, exotic, Oriental mixture...

3. Powder of ox bone and rock salt, p089r

French Transcription

**Sable dos de bœuf brusle
et sal gemme**

Je les ay pulverises separem{ent} & subtilies sur le **porphire** le plus

que jay peu Puys jay mesle aultant dun que daultre & repasse sur le **porphire** Je lay apres humecte dans un **papier** replie dans une **serviette** mouillee qui est plus tost faict quau **serain de la nuit** ou a **lumeur de la cave** Et nen ay point trouve qui despouille plus net que cestuy cy Il veult estre asses humide Et si tu le veulx gecter fort tanvre fais quil soict plus chault Il est venu en **estain** doux fort net co{mm}e le principal Et ha soubstenu plusieurs gects Pour **lestaim** je croy quil nen fault point chercher de meilleur Ne pour le **plomb** fin aussy qui vient quasi plus net que **lestaim** ¶ **Los de pied de boeuf** est tousjours si aride tout seul que sans estre mesle dune part ou deulx de quelque **sable** gras & ayant liaison co{mm}e le **tripoly** les **sels** le **foeultre** les **cendres** & choses semblables il ne despouilleroit pas & ne mouleroit pas net aussy car il sesmie

English Translation

I pulverised them separately and ground them finely on the **porphyry** as much as I could. Then I mixed all of one with the other and re-ground it on the **porphyry**. Afterwards I moistened it in [a sheet of] **paper** folded in a moist **napkin** which is made wet more quickly from the **moisture of the night**, or the [**moisture of**] **the cellar**. I have never found [one] which can be removed more cleanly from the mold than this, though it needs to be quite moist. And if you want to cast small works, make it very hot. For **tin**, I believe that you cannot find a material that takes to powder better, and even for use with fine **lead** which has almost better results than **tin**. The **bone of an ox hoof** is always dry, that is why you must mix it with fatty **sand**, so it will bind like **tripoli**, **salts**, **felt**, **ashes** and similar materials. [If you do not mix **ox-hoof bone**,] it will not turn out from the mold and will not mold cleanly because it crumbles.

Other related recipe from the MS

p69r Sand

Once you have molded, it is good to reheat your mold with the **smoke** of the material you are melting, because the cast would absorb the quality of the **metal**, then this **metal** will flow more easily in something that takes after itself.

The **human bones** are the best for casting when they are calcined.

Sheep foot bones are even better than the **ox foot bones**.

p67v **Ox hooves for sand**

Being well burned two times & pulverized, they mold very cleanly as **sand** and do not need to be recooked, but just heated with the flame of **straw**. But if you are doing core molding, apply the first coat very thinly with your brush, and leave it to dry. Then strengthen the next coats with **wadding** mixed with this aforementioned **sand of bone [hoof]** dampened.

It is the cleanest **sand** one can find for firing.

p88v **Sand from pulverised rock salt and sand from a mineral finely ground on a marble**

After they have been dryly ground and beaten in the mortar, they are ground finely on the **marble** [slab]. I mixed the same quantity of each material, and in order to mix them better, I ground them on the **porphyry** [slab] again, and then filtered this through a double sieve or the sleeve of a **shirt**. Then, I put them on sheets of **paper** and stored it on a **marble** [slab] in a cellar. In one night, they were both moist enough [that there there was no need] to dampen them further because **rock salt**, like all other salts, dissolves in dampness. I molded with this very neatly because both should be quite fine. They should be moist enough so it can be removed easily [from the mold].

p84r **Magistry**

Dissolve **rock salt** or **sandever** that you have pulverized finely and placed on a **marble** slab in a pot. It will dry out while you reheat the mold, and will provide it with a binding to enable several castings. Try moistening it with **tartar oil**.

From other recipe books:

From Cennini, *The Craftsman's Handbook*

P. 5 “What kind of bone is good for treating the panels” Chapter VII

You must know what bone is good. Take bone from the second joints and wings of fowls, or fo a capon; and the older they are the better. Just as you find them under the dining-table, put them into the fire; and when you see that they have turned whiter than ashes, draw them out, and grind them well on the prophyry; and use it as I say above.

p. 5 “How you should start drawing with a style, and by what light” Chapter VIII

The thigh bone of a gelded lamb is good, too, and the shoujlder, clacined in the way desceibed. And then....

Biringuccio, *Pirotechnia*

pg. 137: “The cupels are little vessels ready to receive a certain quantity of lead or other

melted metal in order to refine it. They are made of the ashes of young ram's horn or some other kind of ashes and have a shallow cavity on top..."