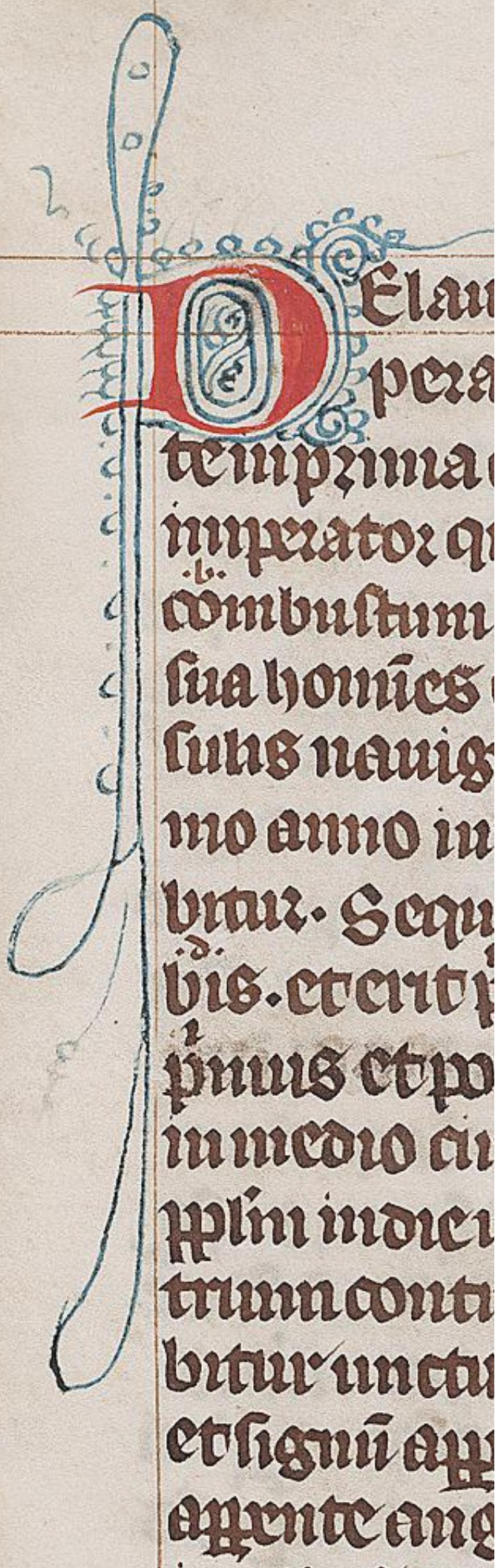


# Medieval Manuscripts

SOME INK & PIGMENT RECIPES



# *Medieval Manuscripts*

## SOME INK & PIGMENT RECIPES

---

*This booklet of ink and pigment recipes  
was compiled by the  
Special Collections Conservation Unit  
of the Preservation Department  
of Yale University Library.  
If you have any comments or questions  
please email the paper conservator at:  
[marie-france.lemay@yale.edu](mailto:marie-france.lemay@yale.edu).*

# *Table of Contents*

## **IRONGALL INK RECIPES**

|  |    |
|--|----|
| Probably XI <sup>th</sup> or XII <sup>th</sup> Century | 5  |
| Probably XII <sup>th</sup> Century                     | 6  |
| XIII <sup>th</sup> Century                             | 7  |
| XIV <sup>th</sup> Century                              | 8  |
| XIV <sup>th</sup> Century                              | 9  |
| XV <sup>th</sup> Century                               | 10 |
| XV <sup>th</sup> Century                               | 11 |
| XV <sup>th</sup> Century                               | 12 |
| XV <sup>th</sup> Century                               | 13 |
| XVI <sup>th</sup> Century                              | 14 |
| XVI <sup>th</sup> Century                              | 15 |
| Late XVII <sup>th</sup> Century                        | 16 |

## **RED INK RECIPES**

|                           |    |
|---------------------------|----|
| XVI <sup>th</sup> Century | 17 |
|---------------------------|----|

## **LAKE PIGMENT RECIPES**

|                                |    |
|--------------------------------|----|
| Madder                         | 18 |
| Brazilwood                     | 19 |
| Cochineal                      | 20 |
| Green & Ripe Buckthorn Berries | 21 |

## **CLOTHLET RECIPES**

|                                   |    |
|-----------------------------------|----|
| Basic recipe for making clothlets | 22 |
|-----------------------------------|----|

# *Introduction*

The recipes in this booklet were compiled from various historical and contemporary sources, mostly from European or Western countries. While the number of recipes is limited, especially for pigments, an effort was made to gather recipes spanning several centuries to show how different and similar they can be. Ink recipes are limited to iron-gall ink, as carbon ink recipes in Western manuscripts are very few, if not absent. Pigment recipes are limited to those obtained from plants or animals, in the form of lakes or clothlets. The letter and number sequence given for each pigment recipe refers to the pigment sample and swatch set included in the Traveling Scriptorium kit as well as the historic pigment set kept in the Conservation Laboratory.

For each recipe the original language (whenever possible) is given. Generally this is Latin or English. Unless noted otherwise, most of the English translations from the Latin are the ones given in the publication. When an English translation was not available in the publication, the recipe was translated from the French.

For those of you interested in digging further, you are encouraged to consult the original texts which are often available in PDF format on the internet.

# Irongall Ink

## PROBABLY XI<sup>th</sup> or XII<sup>th</sup> CENTURY

### 190. The recipe for green ink

Take ripe seeds of the shrub *caprifolium*, that is in English gatetriu, and grind them together well in a mortar; afterwards, let them boil thoroughly in wine, at the same time adding to the concoction iron that has rusted. This is a brilliant green ink. If you want to make cloth or leather green, smear some of this on it with a paintbrush. Now, if you want it to be black, add vitriol to this composition in the usual [way]. But, if you want to prevent this or any other ink from running, put some gum of hawthorn or holm oak into the concoction and cook them together.

---

Accipe grana matura arboris caprifolii, haec est anglice “galetrici” et in mortario bene contere. Post in vino diligenter fac ebulliri, ferrum eruginatum decoctioni simul adiciens; hoc est viride et fulgens incaustum, quod si vis pannum vel corium viridem habere, pincello hinc desuper illine. Si vero vis ut nigrum sit, adde huic compositioni solito atramentum. Quod si vis istud vel aliud, aliquod incaustum facere ne decurrat gummam cini vel prini in decoctionem pone et simul coque ad detemperandum.

---

The English version of the recipe was taken from Cyril Stanley Smith and John G. Hawthorne, *Map-pae Clavicula. A little key to the world of medieval techniques* in Transactions of the American Philosophical Society, New Series, vol. 64, part. 4, 1974.

The Latin and French versions of this recipe were taken from Monique Zerdoun Bat-Yehouda, *Les encres noires au Moyen Âge (jusqu'à 1600)*, Éditions du CNRS, Paris, 1983, p. 166.

**Note:** Although this recipe is not strictly an irongall ink recipe, the addition of vitriol to make a black ink reminds us of an irongall ink.

## PROBABLY XII<sup>th</sup> CENTURY

### Chapter 38. Ink

When you are going to make ink, cut some pieces of [haw]thorn wood in April or in May, before they grow blossoms or leaves. Make little bundles of them and let them lie in the shade for two, three, or four weeks, until they are dried out a little. Then you should have wooden mallets with which you should pound the thorn on another hard piece of wood, until you have completely removed the bark.

Put this immediately into a barrel full of water. Fill two, three, four, or five barrels with bark and water and so let them stand for eight days, until the water absorbs all the sap of the bark into itself. Next, pour this water into a very clean pan or cauldron, put fire under it and boil it. From time to time also put some of the bark itself into the pan so that, if any sap has remained in it, it will be boiled out. After boiling it a little, take out the bark and again put more in. After this is done, boil the remaining water down to a third, take it out of that pan and put it into a smaller one. Boil it until it grows black and is beginning to thicken, being absolutely careful not to add any water except that which is mixed with sap. When you see it begin to thicken, add a third part of pure wine, put it into two or three new pots, and continue boiling it until you see that it forms a sort of skin on top.

Then take the pots off the fire and put them in the sun until the black ink purges itself from the red dregs. Next, take some small, carefully sewn parchment bags with bladders inside, pour the pure ink into them, and hang them in the sun until [the ink] is completely dry. Whenever you want, take some of the dry material, temper it with wine over the fire, add a little green vitriol and write. If it happens through carelessness that the ink is not black enough, take a piece of iron a finger thick, put it into the fire, let it get red-hot, and immediately throw it into the ink.

---

### De encausto

Incaustum etiam facturus incide tibi ligna spinarum, in Aprili siue in Maio prius quam producant flores aut folia, et congregans inde fasciculos sine iacere in umbra duabus hebdomadibus uel tribus aut quatuor, donec aliquantulum exsiccantur.

Deinde habeas malleos ligneos, cum quibus super aliud lignum durum contundas ipsas spinas, donec corticem omnino euellas, quem statim mittes in dolium aqua plenum; cumque duo dolia uel tres seu quatuor aut quinque cortice et aqua repleueris, sine sic stare per octo dies, donec aqua omnem corticis sucum in se emordeat. Post haec mitte ipsam aquam in cacabum mundissimum uel in lebetem, et supposito igne coque; interdum etiam immitte de ipso cortice in cacabum, ut si quid suci in eo remansit, excoquatur; quam cum modice coxeris, eice, aliumque rursus immitte. Quo facto coque residuam aquam usque ad tertiam partem sicque eiciens de ipso cacabo mitte in minorem et tamdiu coque, donec nigrescat atque incipiat densescere, hoc omnino cauens ne aliquod addas aquae, excepta illa quae suco mixta est; cumque uideris eam densescere, adde uini puri tertiam partem, et mittens in ollas nouas duas uel tres, tamdiu coque, donec uideas quod in supremo quasi cutem trahat.

Deinde tollens ipsas ollas ab igne, pone ad solem, donec se nigrum incaustum a rubea faece purificet. Postea tolle folliculos ex pergamento diligenter consutos ac uesicas, et infundens purum incaustum suspende ad solem, donec omnino siccetur; cumque siccum fuerit, tolle inde quotiens uolueris et tempera cum uino super carbones, et addens modicum atramenti scribe. Quod si contigerit per negligentiam, ut non satis nigrum sit incaustum, accipe ferrum grossitudine unius digiti, et ponens in ignem sine candescere, moxque in incaustum proice.

---

This recipe was taken from Theophilus, *On Divers Arts. Theoremost Medieval Treatise on Painting, Glassmaking and Metalwork*, Translated from the Latin with Introduction and Notes by John G. Hawthorne and Cyril Stanley Smith, Dover Publications Inc., New York, 1979, p. 42.

The Latin version was taken from Monique Zerdoun Bat-Yehouda, *Les encres noires au Moyen Âge (jusqu'à 1600)*, Éditions du CNRS, Paris, 1983, p. 156.

## XIII<sup>th</sup> CENTURY

Latin Ink. Take an earthen vase (or jar or pan) that can contain 8 pounds of water; then (add) half a pound of small gall nuts and crush them well; then boil until (the water, the mixture) is reduced by half; then take three ounces of gum arabic and grind it well; and pour (add) the gum to the mixture in the jar and boil it until reduced by half. Remove the jar from the fire and take 4 ounces of vitriol and one pound of warm wine and mix them together in another jar and add little by little to the ink, stirring well. Leave it to rest for two days, and afterwards, every day, stir four times with a stick.

---

Inc laustum latinum; accipe vas de terra quod capiat VIII l. libras aque; postea mediam libram galette et tere bene; postea bulli usque ad medietatem, tunc accipe tres untias gummi arabici et tere bene et colato illo quod est in ollā apponatur gumma, tunc bulliat ad medietatem. Postea aufer ab igne et tunc accipe 4 uncias vitreoli et l. libram vini calidi aliquantulum et debes miscere vinum et vitreolum in alio vase bene, tunc paulatim apponatur ad inc laustum miscendo senper bene; ita stet per duos dies et quolibet die moveatur quarter cum baculo postea.

---

Encre latine. Prends un vase de terre (ou un pot ou un poêlon) qui contienne 8 livres d'eau; ensuite (ajoute) une demi-livre de petites noix de galle et écrase bien; ensuite fais bouillir jusqu'à ce que (l'eau, le mélange) soit réduit de moitié; puis prends trois onces de gomme arabique et écrase bien; et que la gomme soit versée (ajoutée) au mélange qui est dans le récipient, puis que cela bouille (faire bouillir) jusqu'à réduction de moitié. Ensuite, retire du feu et puis prends 4 onces de vitriol et une livre de vin un peu chaud, et tu dois mélanger le vin et le vitriol dans un autre vase (récipient), puis l'ajouter peu à peu à l'encre, toujours en mélangeant bien. Que cela reste ainsi pendant deux jours, et après cela, chaque jour, remue quatre fois avec un bâton.

---

From a manuscript kept at the British Library, London, Harley 3915, fol. 148 v.

The Latin and French versions of this recipe were taken from Monique Zerdoun Bat-Yehouda, *Les encres noires au Moyen Âge (jusqu'à 1600)*, Éditions du CNRS, Paris, 1983, p. 247.

The English version was translated from the French.

## XIV<sup>th</sup> CENTURY

351. To make 3 quarts of ink, take 2 ounces each of galls and gum arabic, and 3 ounces of copperas. Break the galls and soak them for 3 days, then boil in three half gallons of rainwater or water from a still pond. And when they have boiled long enough so that nearly half the water has boiled off—that is, there is only about 3 quarts left—take off the fire, and add the copperas and gum, and stir until cool. Store in a cold, clamp place. Note that after 3 weeks, it will spoil.

---

POUR FAIRE TROIS PINTES D'ENCRE, prenez des galles et de gomme de chascun deux onces, couperose trois onces; et soient les galles cassées et mises tremper trois jours, puis mises boullir en trois quartes d'eau de pluye ou de mare coye. Et quant ils auront assez boulu et tant que l'eau sera esboullie près de la moitié, c'est assavoir qu'il n'y ait mais que trois pintes, lors le convient oster du feu, et mettre la couperose et gomme, et remuer tant qu'il soit froid, et lors mettre en lieu froid et moite. Et nota que quant elle passe trois sepmaines, elle empire.

---

The English translation for this recipe was taken from *The Good Wife's Guide (Le Ménagier de Paris), A Medieval Household Book*, translated, with critical introduction, by Gina L. Greco & Christine M. Rose, Cornell University Press, Ithaca and London, 2009, p. 336.

The original French recipe was taken from *Le Ménagier de Paris. Traité de morale et d'économie domestique composé vers 1393 par un bourgeois parisien*, Tome Second, Paris, 1846, p. 265.



## XIV<sup>th</sup> CENTURY

If you wish to make a good ink or a good “dye”, take twelve pounds of rain water and two pounds of gall nuts and, put the galls in the rain water to macerate until morning. Boil this liquor until it is reduced by half; then carefully filter it through a fine cloth and put it back over the fire; take four ounces of gum arabic and boil it with the liquor until it is dissolved. Filter again; then take one pound of very clear white wine, and three ounces of vitriol and mix them well; add this mixture to the liquor and let it boil a little bit; carefully filter again. This will make a good ink.

---

Si vis facere bonum atramentum sive tinctam bonam accipe de aqua pluviali libras XII et de gallis II, et in sero pone dictas gallas in aquam pluvialem predictam temperando usque ad mane, et fac bulire simul tantum ita quod aqua illa consumetur usque ad mediam partem ; deinde cola illam aquam optime per pannum subtile, deinde repone dictam aquam ad ignem, et accipe de gumma arabica uncias IV, et dimitte bulire cum aqua predicta donec gumma liquefacta fuerit. Et iterum cola eam, postea accipe de vino bono albo et clara libram unam et de vitriolo uncias tres et bene distempera pariter, et fac illud bulire aliquantulum cum aqua predicta et iterum cola bene et erit bonum atramentum.

---

Si tu veux faire une bonne encre ou une bonne « teinture », prends douze livres d’eau de pluie et deux livres de noix de galle et, le soir, mets lesdites noix de galle dans ladite eau de pluie à macérer jusqu’au matin. Fais bouillir le tout jusqu’à ce que la liqueur réduise de moitié seulement; ensuite, filtre cette eau bien soigneusement à travers un linge fin et remets-la sur le feu; prends quatre onces de gomme arabique que tu fais bouillir avec la liqueur susdite jusqu’à ce que la gomme soit liquéfiée. Filtre à nouveau; après quoi prends une livre de bon vin blanc, bien limpide, et trois onces de vitriol et mélange-les bien également; et fais bouillir un peu (ce mélange) avec la susdite liqueur ; filtre encore soigneusement. Et cela fera une bonne encre.

---

From a manuscript kept at the Bibliothèque nationale de France, latin 8651, f. 88 v., Recipe transcribed in *Bibl. de l’École des Chartes*, tome 86 (1925), p. 484.

The Latin and French versions of this recipe were taken from Monique Zerdoun Bat-Yehouda, *Les encres noires au Moyen Âge (jusqu’à 1600)*, Éditions du CNRS, Paris, 1983, p. 178 and 255.

The English version was translated from the French.

## XV<sup>th</sup> CENTURY

### 47. To make good ink for writing, particularly for books.-

Take 4 bottles of good wine, white or red, and 1 lb. of galls, slightly bruised, which must be put into the wine, and allowed to stand for 12 days, and be stirred every day with a stick. The twelfth day it must be strained through a strainer of fine linen, and must be poured into a clean jar, and put on the fire to get hot, until it almost boils. Then remove from the fire, and when it has cooled so as only to be tepid, put into it 4 oz. of gum-arabic, which must be very bright and clear, and stir it with a stick, then add ½ lb. Roman vitriol, and stir it continually with the stick, until all things are well incorporated together, and let it cool and keep for use. And note, that ink made with wine is good for writing books upon the sciences, because, when books are written with it, the letters do not fade, and can hardly be scraped out or discharged from parchment or paper. But if they are written with ink made with water, it is not so, for they can easily be scraped out, and it may happen that the letters written with it will fade.

4 bottles of wine, or water, or half of each.

1 pound of galls of xij. oz. to the pound.

4 oz. of gum Arabic.

6 oz. Roman vitriol.

And if you took equal parts of each, galls, gum, and vitriol, as much of one as of the other, by weight, it would still be good; as for instance, 6 oz. of each, would be sufficient for the said 4lbs. of wine or water, or wine and water mixed as before.

---

### 47. Ad faciendum optimum attramentum por scribendo, precipue libros.-

Recipe bocales iiii<sup>or</sup> optimi vini vermigii vel albi, et libram i. galle modicum fracte, que ponatur in dicto vino, et stet in ipso per duodecim dies, et agitetur omni die cum baculo, ultima vero die colletur bene subtiliter per colatorium tele line; postea ponatur in vase mondo ad ignem, et callescat usque dum quasi bulliat; deinde deponatur ab igne, et cum refigidatum sit, taliter quod sit tepidum, ponantur in ipso onzie iiii<sup>or</sup> gummi arabici bene lucidi et clari, et agiture cum baculo; deinde ponature libra ½ vitrioli romani, et semper misceatur cum baculo, donec bene incorporentur omnia simul, et infigidetur et usui servtur. Et nota quod attramentum factum cum vino est bonum ad scribendum libros scienciarum, que cum de ipso scripti sunt libri, non cadunt littere, neque quasi raddi possunt, nec expelli de carta, nec de papiro. Set si scripti sunt de attramento, seu incausto, facto de aqua, non est sic, que bene radi possunt leviter, et accidere potest quod littere de ipso scripte caduce sint.

Bocales iiii<sup>or</sup> vini, vel aque, vel per medietatem de utroque.

Lipra i. gallarum, de onziis xii. pro lipra.

Onzie iiii<sup>or</sup> gummi arabici.

Onzie vi. vitrioli romani.

Et qui caperet gallas, gummam, et vitrolum, quodlibet ad equale, videlicet totidem de uno quotidem de alio, ad pondus, ad huc bonum esset, videlicet ut onzie vi. de quolibet, quod satis esset pro dictis libris iiii<sup>or</sup> vini, seu aque, vel aque et vini, ut supra.

---

From the manuscripts of Jehan Le Bégue, composed in Paris in 1431, which are found in *Original treatises, dating from the XIIth to XVIIIth centuries on the arts of painting, in oil, miniature, mosaic, and on glass; of gilding, dyeing, and the preparation of colours and artificial gems; preceded by a general introduction; with translations, prefaces, and notes.* By Mrs. Merrifield. v.1, Merrifield, Mary P. (Mary Philadelphia), London, J. Murray, 1849, p. 68.

## XV<sup>th</sup> CENTURY

### 303. To make ink for writing.-

Observe that choice and tried writing must be made in this way. Take iij ounces of galls, the goodness of which may be known by their being wrinkled. Take an equal quantity of gum arabic, the goodness of which may be known by its being bright and easily broken, and the smallest is the best. *Item.* Take 3 ½ oz. of Roman vitriol [sulphate copper?], the goodness of which may be known by its being a blue color, and solid, and coarse after the manner of coarse salt. Afterwards, take four pounds, of twelve ounces to the pound, of clear water, which if it is rain water, or water from a cistern in which rain water is kept, is better than well, spring or river water; and put it into a new metal or glazed earthen jar, which has never been used for anything else, in order that it may be pure and clean from all filth; and into this water, put the galls roughly pounded so that each grain of gall may be broken into four or five pieces, and then let the galls boil in the water without gum or vitriol, until the water is reduced to one-half. Then let it be strained through a cloth or piece of linen, and be put back without the substance of the galls in the vase over the fire, and let it remain there until it begins to boil, and then put into it the gum ground and pulverized, and let it boil gently for a short time, namely, until the gum is dissolved. Having done this, pour into it directly two pounds of the best pure and white wine, and stir it a little, and then immediately add the vitriol well pulverized, stir it again a little, and then remove the vase from the fire, and mix the whole together in order that the vitriol may be well incorporated with the galls, and the gum, and the water. Having done all these things in order, put the vase with the ink in the open air, and let it stand for one night, in order that the air make it brilliant and more black. And therefore if it be done in fine weather, it will be better and finer. Afterwards, strain it through a cloth, and put it by, and keep it for use.

---

### 303. Ad faciendum incaustum seu atramentum pro scribendo.-

Nota quod atramentum electrum et probatum hoc modo debet fieri. Accipe unciae tres gallae, cujus bonitas apparet si minuta in crispa est. Totidem accipe de gummi arabico, cujus bonitas apparet si lucidum et de facili frangatur, et minutum magis valet. Item accipe oncias tres et dimidiam vitrioli Romani, cujus bonitas apparet si est coelesti coloris et solidum et grossum, quasi in modum salis grossi. Postea accipe quatuor libras de onciis duodecim per libram aquae clarae, quae si est pluvialis vel de cisterna reservante aquas pluviales melior est quam putei nec fontis nec fluvii et pone eam in vase metallino vel figuli vitriato novo, quod non sit alteri usui deputatum, ut sit purum et mundum ab omni sorde, et in ipsa aqua mitte gallam grosso modo tritam, ita quod de quolibet grano gallae fiant quatuor vel quinque particulae, et sic bulliat galla in aqua absque gummi et vitriolo, donec aqua reddatur ad medium comminuta. Postea coletur per pannum seu telam et absque substantia gallae reponatur in vase ad ignem et sic tantum stet quod incipiat bullire, et tunc gummi tritum et pulverizatum mittatur in ipsa et bulliat aliquantulum, scilicet leniter usque : quo gummi liquefactum sit. His factis, immediate apponas duas libras optimi vini puri et albi et aliquantulum misce, et immediate mitte vitriolum bene pulverizatum et misceas parum, et statim eleva vas ab igne, et misceas simul totum, ita quod bene incorporetur vitriolum cum galla, et gummi, et aqua. Omnibus his peractis ex ordine pone vas cum ipso atramento ad aerem serenum, et stet per una noctem, ut serenum reddat ipsum lucidum et magis nigrum. Et ideo si fiat sereno tempore, magis valet et pulcrius est. Et postea coletur per telam, et reponetur, et usui servetur.

---

From the manuscripts of Jehan Le Bégue, composed in Paris in 1431, which are found in *Original treatises, dating from the XIIth to XVIIIth centuries on the arts of painting, in oil, miniature, mosaic, and on glass; of gilding, dyeing, and the preparation of colours and artificial gems; preceded by a general introduction; with translations, prefaces, and notes.* By Mrs. Merrifield. v.1, Merrifield, Mary P. (Mary Philadelphia), London, J. Murray, 1849, p. 288.

## XV<sup>th</sup> CENTURY

### 374. To make writing ink.-

Take a bocale of good and strong white wine, 4 oz. of galls well crushed, one handful of dried rinds of pomegranates, one handful of fresh bark of mountain ash scraped with a knife, and one handful of fresh bark of roots of walnut trees, and 2 ½ oz. of gum Arabic; mix the whole together with wine, and let the mixture remain for 6 to 8 days in the sun, stirring it well 4 or 6 times every day. Then add 2 ½ oz. of Roman vitriol, and mix it frequently, and let it remain so for several days; then put it over the fire to boil for the space of one *miserere*, let it cool, and then strain it and leave it for 2 days in the sun. If you then put in it a little roche alum it will make it much brighter, and it will be good and perfect writing ink.

---

### 374. A fare inchostro bono et da scrivere.-

Tolli uno bocale de vino bianco grande et bono et once 4 de galla amachata bene et una manciata de scorze de mele granate seche et una manciata de scorze de ornello fresco rase con lo cortello et una manciata de scorze de raiche de noce fresche poi tollj once 2 et ½ de gomarabico et mistica omne cosa insiemj cum lo sopradicto vino et fa stare per 6 o 8 di al sole et omne di lo mista 4 o 6 volte molto bene poi ce pone doi once et ½ de vitriolo romano et mistalo spesso et stia cosci per alcunj di et poi el pone al foco a bullire per spatio duno miserere et lassalo fredare et poil lo cola et metilo doi dj al sole et se ce mectj poi uno poco dalumj de rocho farallo piu lustro assa et vira perfecta et bona intinta da scrivere.

---

This recipe was taken from *Segreti per Colori (Secrets for making colors)*, composed in Italy in the early XVth century, which is found in *Original treatises, dating from the XIIth to XVIIIth centuries on the arts of painting, in oil, miniature, mosaic, and on glass; of gilding, dyeing, and the preparation of colours and artificial gems; preceded by a general introduction; with translations, prefaces, and notes.* By Mrs. Merrifield. v.1, Merrifield, Mary P. (Mary Philadelphia), London, J. Murray, 1849, p. 590.

## XV<sup>th</sup> CENTURY

How to prepare the ink: take some gum arabic, gall nuts and copperas and grind each one separately in a mortar. Use the following proportions for each: nine parts\* of gum; seven parts of gall nuts; five parts of copperas, then dilute separately (the first two substances) in different jars: the gum with 9 parts of water and the gall nuts with 7 parts of water. Leave both to soak for 2 days and 2 nights. Then, mix them and add the 5 part of copperas and let stand for a day and a night and it is then that the ink is made. If afterwards it becomes too thick, dilute as needed with water.

---

Modus ad faciendum incaustum: recipe gummi de arabia et galles et coprose et tere ea in mortario singula per se et proporciona ea hoc modo : recipe IX coclearia\* plena de gummo et VII coclearia plena de gallis et V de coprose et tempera gummi cum IX coclearibus plenis aque in quodam vase per se et tempera (le) galle cum VII coclearibus plenis aque per se et stent sic per II dies et II noctes ad modefaciendum et postea commisce ea simul et tunc recipe illa V. coclearia de coprose et commisce cum illis et sic omnia iste simul commixta stent una die et una nocte et tunc fit incaustum et postea si fuerit nimis spissum distempera cum aqua secundum exigenciam rationis.

\* Probably a spoonful.

---

Mode de préparation de l'encre : prends de la gomme arabique, des noix de galle et de la couperose et broie chacune de ces substances séparément dans un mortier. Dose-les dans les proportions suivantes: neuf mesures\* bien pleines de gomme ; sept mesures bien pleines de galles ; cinq mesures bien pleines de couperose, puis dilue séparément (les deux premières substances) dans un vase distinct: la gomme avec 9 mesures bien pleines d'eau, les galles avec 7 mesures bien pleines d'eau. Laisse chacun de ces deux mélanges macérer pendant 2 jours et 2 nuits. Ensuite, mélange-les, puis incorpore les 5 mesures de couperose et laisse reposer le tout pendant un jour et une nuit et c'est alors que se fait l'encre. Si, par la suite, elle devient trop épaisse, dilue-la avec de l'eau comme bon te semble.

---

From a manuscript kept at the British Library, London, Arundel 507, fol. 100 v.

The Latin and French versions of this recipe were taken from Monique Zerdoun Bat-Yehouda, *Les encres noires au Moyen Âge (jusqu'à 1600)*, Éditions du CNRS, Paris, 1983, p. 262.

The English version was translated from the French.

## XVI<sup>th</sup> CENTURY

### **Recipe to make good ink:**

Take one ounce of gall nuts crushed to pieces, then place them in a piece of cloth that you will tie not too tight; put the galls to soak in twelve ounces of rain water and let macerate at least six days; once this is done, boil until the mixture is reduced to eight beautiful and unctuous ounces; then you will put in it one quart of german vitriol well ground and a half ounce of gum that will have soaked in vinegar; only use as much vinegar as is necessary and you will make a marvelous ink.

---

### **Ricetta da fare inchiostro fino :**

Togli una oncia di galletto pisto in pezzeti, et poi lo metterai in una pezza di tela et ligarella, non troppo stretta et meteralla a mollo in XII oncia d'acqua, che sia piovana, et lassalo stare almen sei giorni, et fatto questo fallo bollire tanto che torni otto oncie bello et colato et puoi mettarevi dentro un quarto de vetriolo todesco molto ben spolverizzato, e meza oncia di gumma che sia stata a molle in aceto e che l'aceto non sia più del bisogno et tu farai un inchiostro mirabilmente buono.

---

### **Recette pour faire une encre de qualité:**

Prends une once de galles (ou de gallons) écrasées en morceaux, puis place-les dans un morceau de toile que tu lieras sans trop serrer ; mets-les à tremper dans douze onces d'eau (qui doit être) de pluie et laisse macérer au moins six jours ; ceci accompli, fais bouillir jusqu'à ce que cela réduise à huit onces belles et onctueuses ; puis tu mettras dedans un quart de vitriol allemand très bien pulverisé et une demi-once de gomme qui aura macéré dans le vinaigre ; celui-ci ne doit pas être en quantité supérieure à ce qui est nécessaire et tu feras une encre merveilleusement bonne. »

---

This recipe was taken from the *Thesaurus de Scrittori* written in 1515 by Sigismond de Fanti; the complete title of the manuscript is as follows: Opera artificiosa laquale con grandissima arte, si per pratica, come per geometria insegna a scrivere diverse sorte littere : cioe cancellarescha, merchantescha, formata, cursiva, antiqua, moderna et bastarda, di piil sorte : cum varii et bellissimi exempli e altre sorte littere de varie lingue : cioè grecha, hebraicha, caldea a arabicha : tutte estratte da diversi e probatissimi auttori: et massimamente dalo perfectissimo Sigismundo Fanto nobile ferrarese : mathematico et archittetor e eruditissimo : deli mesure/e/ raggione de littere primo inventore : intagliata per Ugo da Carpi. Cum gratia et privilegio.

Anchora insegna de atemperare le penne secundo diverse sorte littere/e/ cognoscere la bonta de quelle, e / carti; e fare inchiostro e verzino. Cenaprio/e/vernice. Cum multi altri secreti pertinenti alo solito et eccellenti scrittore come per te medesimo legendo impararai. Nel anno di nostra saluti MDXXXV.

The Italian and French versions of this recipe were taken from Monique Zerdoun Bat-Yehouda, *Les encres noires au Moyen Âge (jusqu'à 1600)*, Éditions du CNRS, Paris, 1983, p. 297.

The English version was translated from the French.

## XVI<sup>th</sup> CENTURY

### **To make inke to write on paper.**

Take halfe a pint of water, a pint wanting a quarter of wine, and as much vinegar, which being mixed together make a quart & a quarter of a pint more, then take six ounces of gauls beaten into small powder, and sifted through a sive, put this powder into a pot by it selfe, and poure halfe the water, wine and vinegar into it, take likewise four ounces of victriall, and beat it into powder, and put also into a pot by it selfe, whereinto put a quarter of the wine, water & vinegar that remaineth, and to the other quarter, put four ounces of gum Arabike beaten to powder, that done, cover the three pots close, and let them stand three or four daies together, stirring them every day three or four times, on the first day set the pot with gauls on the fire, and when it begins to seeth, stir it about till it be thouroughly warme, then straine it through a cloath into another pot, and mixe it with the two other pots, stirring them well together, and being couered, then let it stand three daies, till thou meanest to use it, on the fourth day, when it is settled, poure it out, and it will be good inke. If there remaine any dregs behind, pour some raine water (that hath stand long in a tub or vessel into it, for the older the water is, the better it is, and keepe that until you make more inke, so it is better the clean water.

---

### **To make inke for parchement.**

Make it in all points like to the inke aforesaid, only take a pint of water, & of vinegar and wine more, that is of each halfe a pint.

---

### **Another sort of inke.**

Take a quart of cleare water, and put it in a glasse, put into it thirtheene ounces beaten victriall, let it stand three daies, and stir it three or foure times every day, then take thirteen ounces of beaten gaules, and put them into a new earthern pot that is wel leaded, pour into them a quart of cleane water, that done, set it on the fire, and let it seeth til it consumeth about a finger deepe, but suffer it not to seeth so fast that it seeth over the pots brim, then strain it through a wollen cloath, into another pot, that is leaded, poure into the cloath a cup full of good vineger, and strain it through likewise, that done, if there remaineth any thing in the cloath, cast it away, then put into the matter, foure or five ounces of beaten gum, and stir them well together, then againe straine them through the cloath, and let it stand till it be cool, then put it into a straightnecked glasse, stop both the glasses well, till you have occasion to use them, then take of each water a little quantitie, and mix them together, so have you good inke.

---

These recipes were taken from *A Booke of Secrets: Shewing diuers ways to make and prepare all sorts of Inke, and Colours: as Black, White, Blew, Greene, Red, Yellow, and other Colours. Also to write with Gold and Silver, or any kind of Mettall out of the Pen; with many other profitable secrets as to colour Quils and Parchment of any colour: and to graue with Dtrong Water in Steele and Iron. Necessarie to be knowne of all Scriueners, Painters and others that delight in such Arts.* Translated out of the Dutch into English, by W.P., London, 1596.

Link to facsimile can be found in Orbis at the following URL: <http://hdl.handle.net/10079/bid/6844828>

## LATE XVII<sup>th</sup> CENTURY

### **To make excellent ink**

Raine water 3 gallons, of white wine vinegar a quart, gaules two pounds, gum arabeck one pound, pomegranate pills one quarter of a pound, all these bruised but not beat too small, copporus two ounces, this will be ready the sooner, if it stand near by the fire, or in the sun.

---

This recipe was taken from Osborn b115 (59r-58v), a commonplace book, part of the James Marshall and Marie-Louise Osborn Collection at the Beinecke Rare Book and Manuscript Library, Yale University.

The following is a link to an image of the recipe page: [http://beinecke.library.yale.edu/dl\\_crosscollex/brbdl\\_getrec.asp?fld=img&id=1118038](http://beinecke.library.yale.edu/dl_crosscollex/brbdl_getrec.asp?fld=img&id=1118038)



# Red Ink

## XVI<sup>th</sup> CENTURY

### **Of red colour, and first of Brasill.**

You must take care when you seeth Brasill, that you do it when the element is clear, without clouds, rain, or wind, otherwise it will not be good you must make it thus:

Take quicklime poure rain water upon it, let it stand all night, in the morning poure the water softly from the lime or straine it through a cloath, & for a quart of water, take an ounce of Brasill, let it seeth till it be halfe consumed, then put into it one ounce of gum Arabike, two ounces of gum of a Cheritree, or else two ounces of cleane glue, straine it from the wood: you may likewise put into it some chalke beaten to powder.

---

### **To seeth Brasill in another way.**

To an ounce of Brasill, take the third part of a quart of beere, wine or vinegar, put it in a new pot let it stand a night, in the morning set it on fire and let it seeth till it be halfe consumed, then for euery ounce of Brasill, take two pennyworth of alum, beaten to a powder, and as much beaten gum Arabike, stir them wel together, and let them seeth againe, but if you desire to have it somewhat dark, then scrape a little chalke into it: when it seetheth, let it not seeth over the pot, and being cold, strain it through a cloath, and put it into a glasse well stopped.

---

This recipes were taken from *A Booke of Secrets: Shewing diuers ways to make and prepare all sorts of Inke, and Colours: as Black, White, Blew, Greene, Red, Yellow, and other Colours. Also to write with Gold and Silver, or any kind of Metall out of the Pen; with many other profitable secrets as to colour Quils and Parchment of any colour: and to graue with Dtrong Water in Steele and Iron. Necessary to be knowne of all Scriueners, Painters and others that delight in such Arts.* Translated out of the Dutch into English, by W.P., London, 1596.

Link to facsimile can be found in Orbis at the following URL: <http://hdl.handle.net/10079/bid/6844828>

# Lake pigments

## MADDER (RECIPE M-I)

### 11. To make fine lake.-

Take the ashes of oak, and make a ley, and boil in it clippings of fine scarlet of rubea de grana until the colour is extracted from the clippings, and then strain the ley with the colour through a linen cloth. Afterwards take some more ley, similar to what you first took, and heat it, and put into it some finely powdered roche alum, and let it stand until the alum is dissolved. Then strain it through the strainer with the liquor or ley in which the clippings were put, and immediately the ley will be coagulated, and make a lump or mass, which you must stir well. Remove it afterwards from the vase, and lay it on a new hollow brick, which will absorb the ley, and the lake will be left dry. You must afterwards take it off the brick and keep it for use.

---

### 11. Ad faciendum lacham finam.-

Tolle cineres ligni cerri, vel roboris, et fac lexivium, et in ipso fac bulire cimaturam scarlate fine rubeae de grana, tantum quod ex dicta cimatura extractus sit color; postea ipsum lessivum, cum dicta cimatura, colla per pannum lineum; postea accipe de alio lexivio simili suprascripti quod prius accepisti, et calefac, et pone in ipso de alumine roche trito subtiliter, et permitte donec alumen sit fusum, postea cum dicto colatorio cola ipsum in dicta alia collatura vel lexivio, in quo stetit cymatura, et subito dictum lessivum stringetur, et faciet unam bussaturam seu massam, quam mistica bene, et postea trahe ipsam de vase, et pone in madono concavo novo, qui bibet lessivium, et remanebit sicca dicta lacha, quam postea trahe de madone et serva usui.

---

This recipe was taken from *Experiments de Coloribus* in the Manuscripts of Jehan Le Bègue which is found in *Original treatises, dating from the XIIIth to XVIIIth centuries on the arts of painting, in oil, miniature, mosaic, and on glass; of gilding, dyeing, and the preparation of colours and artificial gems; preceded by a general introduction; with translations, prefaces, and notes.* By Mrs. Merrifield. v.1, Merrifield, Mary P. (Mary Philadelphia), London, J. Murray, 1849, p. 50.

## BRAZILWOOD (RECIPE B-3)

### 14. To make a fine rose color.-

Take fine brexilium, and scrape it fine, and take strong ley made with ashes of oak, and make it boil, and pour it over the said verzino into a glazed earthen saucer, so as to cover the brexilium, and let it stand for an hour. Then take the egg-shells, pound them well, and grind them very fine on a porphyry slab with clear water, and lay them on a new hollow brick, that the water may be absorbed. Afterwards, put them into a glazed earthen jar, and pound up some roche alum, and mix with the powdered egg-shells; afterwards strain the ley in which the verzilium is put, and pour the ley which is dyed red with the verzilium upon the egg shells, and mix, that the whole may be incorporated together; afterwards dry the lake, not in the sun, but on a hollow brick, straining it through a linen cloth, and you will have a perfect rose colour.

---

### 14. Ad faciendum colorem rosete fine.-

Accipe berxillium finum, et rade subtiliter, accipe de lessivio forti facto de cineribus cerri, quod fac bul-lire, et ipsum mitte desuper dicto versino, in una scutella terre vitreata tantum quod cooperiat verxilium, et stet per horam; postea accipe corticas ovorum, et trita bene, et molle super lapide porfirico cum aqua clara subtiliter, et pone super madono concavo novo ut aqua decicetur. Postea pone in scutella vitriata, deinde pista de alumine roche, et misce cum dictis corticis tritis, et postea cola lissivium in quo est verxillium, et lessivium illud rubefactum a verzilio mitte desuper dictas corticas, et misce ut incorporentur omnia, et postea desica, non ad solem, et super madono concavo, colando per telam, et habebis perfectam rosetam.

---

This recipe was taken from *Experiments de Coloribus* in the Manuscripts of Jehan Le Bègue which is found in *Original treatises, dating from the XIIth to XVIIIth centuries on the arts of painting, in oil, miniature, mosaic, and on glass; of gilding, dyeing, and the preparation of colours and artificial gems; preceded by a general introduction; with translations, prefaces, and notes.* By Mrs. Merrifield. v.1, Merrifield, Mary P. (Mary Philadelphia), London, J. Murray, 1849, p. 52.

---

**Note:** Recipe B-2 in the pigment sampler set was made using potassium carbonate while recipe B-3 was made using calcium carbonate for egg shells. With potassium carbonate the final lake pigment is darker and more transparent than with chalk.

## COCHINEAL (RECIPE C-2)

### 116. Another sort of fine lake.-

Take 12 grains of powdered cochineal or fine grana, add to it 2 ounces of ley; leave the infusion for about 2 hours; strain it through a linen cloth, and put it over hot cinders. When it boils, add to it pulverized roche alum of the size of 2 peas, when the ley will make a thick red scum; as soon as this happens throw it all on to a stretched linen cloth, which coagulum must afterwards be dried and made into tablets.

---

### Un'altra sorte di lacca fina.-

R. Piglia 12 grani de cocciniglia , o grana fina fatta in polvere, si pone in due oncie di lissivio lascian-  
dola in infusion due hore incirca poi si cola per pano lino, e si mette sopra cenere calda, quando vorrà  
bollire vi si aggiunge quanto due piselli d'allume di rocca in polvere, quando il liscivo farà schiuma  
grossa incarnata all'hora si getta tutto in un panno lino steso, e passerà il lissivo chiaro restando la  
schiuma nel panno, quale si fa seccare, e si fa tavolette.

---

This recipe was taken from *Ricette per far ogni sorte di colori, etc.* (Paduan Manuscript) which is found in *Original treatises, dating from the XIIth to XVIIIth centuries on the arts of painting, in oil, miniature, mosaic, and on glass; of gilding, dyeing, and the preparation of colours and artificial gems; preceded by a general introduction; with translations, prefaces, and notes.* By Mrs. Merrifield. v.2, Merrifield, Mary P. (Mary Philadelphia), London, J. Murray, 1849, p. 702.

## GREEN & RIPE BUCKTHORN BERRIES (RECIPES BT-1, BT-2, BT-3 and BT-4)

### 89. To make a good green with buckthorn.-

Take small berries of buckthorn when quite ripe, put them into a glass vase, and crush them well with your hands; then place them in the sun, and let them remain until the juice rises above the berries; then strain the refuse, and throw it away, and if the juice weighs one pound put into it the weight of two quattrini\* of roche alum in powder. Place the mixture in the sun in a well-closed glass vase, and let it stand three or four days, stirring it well three or four times every day; and if it should happen to dry after a time, distemper it with clear ley, with a little gum.

\* Quattrini. Small copper coin, worth about the fifth part of a crazia, or the 60th part of a Florentine lira; perhaps so called because quattrino was the value of four denari or picciolo, now no longer in use. Alb. Diz.

---

### 89. Affare verde bono cum spingerbino.-

Recipe granelli de spingerbino quando sono bene mature et metili in uno vaso de vetro et amalpali bene cum le mano et metili al sole et lassali stare tanto che leve suso li grappi e quelle venacie poi li cola et premili bene et gieta via quella venacia et grappi et se lo dicto sugo fusse una libra metice doi quattrini dalumi de rocho spolverizato poi lo pone al sole in vaso de vetro ben serato et lassalo stare 3 o 4 di et omni di lo mistica 3 o 4 volte molto bene atorno et per spatio de tempo se secasse distemperalo cum ranno da capo chiaro cum uno poco di gomma.

---

This recipe was taken from *Segreti per Colori (Secrets for making colors)*, composed in Italy in the early XVth century, which is found in *Original treatises, dating from the XIIth to XVIIIth centuries on the arts of painting, in oil, miniature, mosaic, and on glass; of gilding, dyeing, and the preparation of colours and artificial gems; preceded by a general introduction; with translations, prefaces, and notes.* By Mrs. Merrifield. v.1, Merrifield, Mary P. (Mary Philadelphia), London, J. Murray, 1849, p. 420.

---

**Note:** For all recipes we used dried berries that were left to soak overnight and then were simmered for a couple of hours to extract the colour. For recipes BT-1 and BT-3, chalk (or calcium carbonate) was added to precipitate the color and give the pigment some body (or opacity). For recipes BT-2 and BT-4, potassium carbonate was added to precipitate de pigment. With potassium carbonate the final lake pigment is darker and more transparent than with chalk.

# Clothlets

## BASIC RECIPE FOR CLOTHLETS (B-1, C-1 and C-3)

The color is made from these lilies as follows. Take these fresh flowers in the springtime when they are blooming, and pound them in a marble or bronze mortar and squeeze the juice with a cloth into a glazed porringer. And in this juice soak other linen cloths, clean and soaked once or twice in a solution of rock alum and dried. And when the cloths are thoroughly saturated with the juice of the lilies in this way, let them dry in the shade; and keep them between the leaves of books; for a very lovely green, splendid for use on parchment, is made out of this juice preserved in this way by combining it with giallorino. And note that after the cloths are dry, if they are again soaked in this juice and dried, they will be better.

And you do the same thing with those buckthorn berries which are gathered in the vintage season, namely, in this fashion. Take the aforesaid seeds or berries, put them into a glazed porringer, and break or crush them well with your fingers. Then dissolve in clear lye; not too strong, as much rock alum as it will dissolve on the fire. And pour enough of this lye and alum over the berries in the porringer to cover these berries, crushed as directed. And let them stand so, out of the way, for three days; and then wring them out with your hands in a linen cloth, and strain the juice into another glazed porringer. And if you want, you can keep it in linen cloths; do throughout as directed above for the juice of the lilies. But otherwise put it into a glass bottle, and keep it by sealing the bottle.

---

This recipe was taken from *An Anonymous 14th Century Treatise De Arte Illuminandi, The Technique of Manuscript Illumination* translated from the Latin of Naples MS XII.E.27 by Daniel Varney Thompson, Jr, and George Heard Hamilton, Yale University Press, New Haven, 1933, p. 6.

---

**Note:** For recipe C-3, the red cochineal clothlet, a small quantity of cream of tartar was added to recipe C-1, the purple cochineal clothlet. The cream of tartar alters the pH of the original purple solution making it more acid and more red.

*Specials Collections Conservation  
Preservation Department, Yale University Library  
February 2012*

*Cover image: Beinecke Rare Book & Manuscripts Library, Vaticaniana Pontificum, etc., Marston MS 225, folio 25r*