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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. Philadelpia
MRS. MERRIFIELD,

HONORARY MEMBER OF THE ACADEMY OF FINE ARTS AT BOLOGNA, TRANSLATOR OF
THE TREATISE ON PAINTING OF CENNINO CENNINI, AND AUTHORESS OF
'THE ART OF FRESCO-PAINTING.'

IN TWO VOLUMES.—VOL. II.

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ERRATA.

Page 339, line 15 from top, *for couch read coat.*

377, *dele note* (!).

610, line 3 from bottom, *for "a putrido" is, read "a putrido," i. e. with.*

668, 6 bottom, *for sandals, read taffeta.*

674, 6 top, *for a stone impervious to water, read an absorbent stone.*

712, 14 bottom, *for with goatskin, and rub the work well, read and rub the work well with goatskin.*

730, 14 bottom, *for Riformati, read Riformate.*

748, 8 top, *for abazzo, read abbozzo.*

796, 10 bottom, *for Villalpandur, read Villalpanus.*

BOLOGNESE MANUSCRIPT,

ENTITLED

“SEGRETI PER COLORI.”

BOLOGNESE MANUSCRIPT.

PRELIMINARY OBSERVATIONS.

THIS MS. is of the fifteenth century. It is a small volume in duodecimo, on cotton paper, and is preserved in the Library of the R. R. Canonici Regolari in the convent of S. Salvatore in Bologna. It is numbered 165. On the outside of the fly-leaf is written "D'acquisto di D. Gio. Giuseppe Trombelli," and on the other side of the same "Libro di P. Gio. Batta Nozzi, di carte 240."

The first intimation we had of the existence of this MS. was from the 3rd series of the "Memorie di Belle Arti," p. 111, of Sig. Gualandi (Bologna, 1842), who mentions that it was with other MSS., in number about 500, carried to Paris, where the words "Bibliothèque Nationale" were stamped on it, and whence it has been since restored to its original depository.

On my arrival at Bologna Sig. Gualandi very kindly introduced my son to the Generale of the Canonici Regolari at the convent of S. Salvatore, and obtained permission for him to copy it.

It is a book of recipes rather than a treatise, and affords interesting notices of all the decorative arts practised at that period in Bologna. The arrangement

is systematic, and I consider it an arranged collection,¹ the author having copied different recipes as he became acquainted with them, and arranged them in their proper places, leaving blank sheets between each chapter or subject, for additional recipes. The name of the author does not appear; but as we find that the last sections in many of the chapters are written in a different character, it may safely be inferred that these additions were made at a period somewhat later than the rest of the MS., and probably after the death of the original collector. The additions, which appear by the handwriting to have been made at least half a century after the other part of the work, are written with fewer contractions, in a more running character, and with finer strokes to the letters; the black ink is not so pale, and the rubrics have nearly disappeared, while those of the earlier writing are as bright as at first. The later sections are distinguished in the present work by the letter B in the margin.

The language in which the MS. is written, is sometimes Italianised Latin, and sometimes Italian, with a mixture of Latin words, as was usual at that period, and the different recipes contain words from most of the dialects of Northern Italy, in which, however, the Lombard seems to prevail, and the same word is frequently spelled in three or four different ways.

The precise date of the MS. is not mentioned, but there are allusions to circumstances which seem to fix the date to the first quarter, or at latest, to the middle of the fifteenth century.

¹ That some of the recipes were copied is proved by the occasional blanks that are left in the MS.

In No. 136 is a recipe for making a "colore cardinalesco," in the later handwriting. Now the "colore cardinalesco" at this period was *crimson*, as appears from this chapter, and not scarlet. As the Cardinals did not assume the red dress until 1464,¹ it follows that this additional chapter must have been written previous to this date, and therefore that the original MS. was some years older. The author also desires that alabaster of Constantinople should be used for a certain purpose, a proof that the communication with that city still subsisted. This city was taken by Mahomet in 1452, and it is well known that the importation of pigments was impeded, if not altogether stopped, when the Turks became masters of Constantinople. (See Agricola, de Metallicis.) The different articles mentioned in the MS. show that Bologna at this period had considerable intercourse with other states. We find Giallolino and Azzurro della Magna, Spanish pitch, Roman tin, Venetian tin, Alexandrine borax, lapis lazuli from Damascus and Cyprus, sand from the Val d'Arno, besides the usual gums and resins, Indian lac, indigo, &c.

The first five books treat of the preparation and manufacture of blue, green, and lake-coloured pigments. The first book treats of natural blue pigments, by which we learn the old masters possessed two, namely, Ultramarine and the Azzurro della Magna of Cennini, also called in this MS. Azzurro Todesco or Azzurro Teothonicum, Azzurro Spagnolo, and Azzurro di Lombardia. The author teaches how to distinguish one pigment from the other, and to prepare both for painting. The

¹ See note by Sig. Tambroni to Cap. 42 of the Treatise of Cennini.

second book treats of factitious mineral blue pigments. The third book of blue pigments made from flowers. The fourth treats of green pigments. The fifth book shows that at this period lakes were made from lac, from kermes, and from Brazil wood, which last is identified with *verzino* — “*verzino o vero Brasilio.*” The sixth book is devoted to the composition of “*porporino,*” which was an imitation of gold. It also contains directions for gilding.

The seventh book is a practical course of painting after the manner of Magister Jacobus de Tholeto, who was probably a Spaniard.¹

This book also commences with recipes in Italian for making certain colours, among which is the “*arzica*” of Cennini, and then follow directions in Latin, which appear to be from an older work, “*ad fatiendum incarnatum pro incarnare figuras,*” “*ad incarnandum crucifixum,*” “*ad fatiendum incarnatum,*” &c. The author also gives instructions for preparing panels, and “*gesso sottile*” for painting.

The style of painting, as appears from the seventh book, resembled that which, according to Malvasia, prevailed in Bologna in the early part of the fifteenth century.

If we may be allowed to form an opinion of the skill of Magister Jacobus from his writings instead of his paintings, I fear we cannot assign him a high rank as a painter. The flesh colour was first to be laid on, then the eyes and outlines of the limbs were to be marked with black, the eyebrows with *sinopia* and black, the pupils of the eyes black, and a shade of *sinopia* under

¹ See No. 245. There was a Spanish college at Bologna; and S. Maria Maddalena, formerly an hospital under the title of S. Onofrio, was built in 1343 for the Spaniards.

the chin. These directions are sufficient to identify Jacobus with one of those painters who were contemporary with, or immediate successors of Lippo Dalmasio, described by Malvasia,¹ who, uninfluenced by the good example of Lippo, persisted in following the barbarous Greek style introduced from Constantinople. These artists lived in Bologna during the latter end of the fourteenth and beginning of the fifteenth century. Pietro di Lianori, who retained the Greek manner, and who surrounded his figures with black outlines, painted in the year 1415 a picture in the ancient church of S. Fidriano di Lucca in Bologna, then belonging to the R. R. Canonici Regolari, in whose library the original MS. from which the present is copied is still preserved, and there is nothing unreasonable in supposing that the MS. may describe his method of painting.

The vehicle used by Jacobus appears to have been egg and gum-water, but when it was required to make a drapery of a fine and beautiful rose colour, lac and ceruse were ground with linseed oil and white of egg.

After this we have an "aquam que est bona ad ponendum super figuris et altris miniis." This consists of oil of aloes, linseed oil, and "vernice liquida." And in order that no information should be wanting to his readers, Jacobus de Tholeto tells us how to make linseed oil, and then how to make "vernice liquida," for which he gives two recipes, the first made of linseed oil and "gomma de gineparo," the second of linseed oil, roche alum, and incense.²

¹ Felsina Pittrice, vol. i. pp. 30, 31.

² A third recipe, probably written by a later hand, for vernice liquida made of linseed oil and "vernice da scrivere," is given in No. 262.

It was the belief of Malvasia and Tiarini,¹ that Lippo Dalmasio and Pietro Lianori, both of whom must have been contemporaries, or nearly so, with the author of this MS., painted in oil; but chemists have asserted that it is impossible to decide whether paintings have been executed with colours mixed with oil, or whether they have been painted in distemper and then varnished.

There is nothing in the present MS. to show that the art of painting in oil was known at this period in Bologna (otherwise than in the imperfect manner before mentioned), although there is proof that the effects of boiling the oil, and not only of boiling, but of setting fire to it, were well understood. It is therefore probable, that the old pictures in Bologna which Malvasia says were painted in oil, were, in fact, painted in distemper, and then covered with the varnish described in the MS.; for if painting in oil had been practised at Bologna at the time the MS. was written, the author could scarcely have failed to become acquainted with it, and to record it in his work, as St. Audemar, Le Begue, and Cennini have done.

The art of distilling oils was also known and practised at this time in Italy, for the distilled or volatile oil of linseed is mentioned in No. 238, accompanied with a remark, that colours mixed with it will last for ever; and spirit of turpentine, the "acqua di ragia" of the Italians, is also spoken of in No. 246.

In No. 236 directions are given for preparing earths for use "in muro o in calcina." As these were tem-

¹ Felsina Pittrice, vol. i. p. 27.

pered with strong gum water, or with the white and yolk of an egg well mixed, and beaten with the branch of a fig-tree cut into small pieces, it is clear that the author does not speak of painting in "buon fresco;" at the same time it is doubtful whether he is speaking of painting, or merely of the letters or legends which were at that time frequently written on pictures.

The next subject treated of is the making of artificial gems, in which the author appears to have again had the assistance of his Spanish friend. The base of these factitious gems consists principally of a glass composed of crystal, calcined stag's bones, and sal alkali, without lead.

The early recipe in No. 268 for colouring glass red with copper, will be read with interest. The art of composing this colour was lost, although recipes for it have always existed. The note in the text alludes to a difficulty which exists in preparing this colour, from the tendency of the copper to pass into the state of peroxide, in which state it tinges glass green.¹

The application of the diamond to cutting glass was, it is said, suggested by the well-known anecdote of Francis I., who, in order to let the Duchess d'Estampes know that he was jealous, wrote the following lines on a pane of glass, which, says Le Vieil (*De la Peinture sur Verre*, p. 206), may still be seen in his castle of Chambord:—

"Souvent femme varie
Mal habil qui s'y fie."

"The effect," he continues, "of the impression of one of the points of this diamond on the glass, caused

¹ See Beckmann's *Inventions*, tit. Coloured Glass, which contains some interesting notices respecting this colour.

it to be remarked that the characters were not only engraved on it, but that the glass was actually cut; thus an accident proved that the diamond was adapted for cutting glass, and doubtless gave rise to the practice which soon became general."

It is a pity to spoil so good a story by proving the invention to be older, but the truth must be told, and it will be seen by No. 217, that the art of cutting glass with a diamond was known and practised in Italy at the period when this MS. was written, that is, more than a century previous to the time of Francis I. The circumstance, trifling as it may appear, is useful in ascertaining the period when coloured glass was executed.

The same chapter (No. 217) also proves that the art of corroding glass by means of an acid was known and practised contemporaneously with the last-mentioned invention. The directions for preparing the acid liquor are so clear as to place this beyond a doubt. "When," says the author, "you wish to use this liquor, take equal quantities of each of these three waters; mix them together, draw with the mixed liquor upon the glass, and it will be cut exactly as you wish wherever it is wetted by this water." The fact of the three liquids being kept in separate bottles is a proof of their effects when mixed. They would probably have corroded the glass, which perhaps contained lead or other metals, easily acted upon by acids.

The invention of this art has been attributed by Beckmann to Henry Schwanhard, glass-cutter to the Emperor Rudolph in 1670; and the invention is said to have originated in the following occurrence:—Some aqua-fortis having one day fallen accidentally on the spectacles of Schwanhard, the glass was corroded by it,

and from this he learned to make a liquid by which he could etch writing and figures upon plates of glass.¹ Beckmann remarks, that it is not known how Schwanhard prepared this liquid, and that "at present we are acquainted with no acid, but that of fluor-spar, which will corrode every kind of glass."²

The conclusion of the same chapter in the MS., No. 217, also shows that glass mirrors were in general use.³

It will also be observed, that the art of painting on glass with enamels of various colours is distinctly described in No. 270; and the "smalti," or enamels, are also mentioned in No. 1. It is usually considered that these were not in use until after the middle of the sixteenth century: the chapter in the text will, I think, disprove this fact. The same "smalti" are also mentioned in the MS. of the Marciana (No. 325, which is of the sixteenth century), with the additional information that they were brought from Germany. It is probable, therefore, that they were in general use for painting on glass in Italy during the fifteenth and sixteenth centuries. Gaye has shown⁴ that the windows in the Duomo d'Arezzo, painted in 1477 by Frati Cristofano and Bernardo, were to be executed with colours "cotte al fuoco e non messi a olio." The colours "cotte al fuoco" were, probably, these smalti, or enamel colours.

¹ See Sandrart, *Teutsche Akademie*, vol. i. p. 346; Doppelmayer, p. 250.

² *Inventiones*, tit. *Glass-cutting*.

³ Glass mirrors are known with certainty to have been used in the thirteenth century.

⁴ *Carteggio Inedito d'Artisti*, vol. ii. p. 446.

This MS. also gives the composition of the old pigment Giallolino, which was made of lead, tin, red lead, and sand; and a method of applying leaf gold on glass, in which a solution of borax is the flux.

The author next treats of Mosaics, and first of the white material which serves as a base for the colours. The blue colour is produced by adding ultramarine to the white material. The red colour for the Mosaics is formed of tin and calx of gold, with other ingredients, thus affording a certain proof of the antiquity of red colours produced from gold.¹ While on the subject of the production of colours from gold, it may be mentioned that in No. 32 there is a description of the process of procuring a purple from gold, by dissolving it in aqua regia (nitro-muriatic acid), and then precipitating it with the oxide of tin, a process which seems analogous to the preparation of the purple of Cassius, and the date of this must be at least 150 years previous to the first notice of the purple of Cassius in the history of art. It will also be observed that No. 318 describes a yellow colour for painting made from silver, the discovery of which has been ascribed, although without sufficient foundation, to Van Eyck. The production of a yellow colour, for painting on glass, from silver, has always been attributed to the Flemings; but this recipe bears strong evidence of a French origin, for *French* ochre is directed to be used, and the ingredients are weighed by the usual French weights "denari." At the same time, however, it will be observed that the

¹ Mr. Hendrie (Theoph. E. E. p. 174) quotes some recipes for factitious gems from an old MS. in the British Museum (Sloane MSS., No. 3661), in which gold is used.

word "giallo" is written according to the Venetian dialect. The term "anconitani" proves that it was in use in Italy, and probably for painting on pottery as well as on glass. No. 322 also describes a gold colour made from silver, for painting vases previously glazed. This is one of the additional chapters, and may therefore have been written at a later period.

The next subject, glazes for pottery, is interesting because it shows what glazes were in use at this period. The base of the glaze employed was tin, to which was generally added Marzachotta, which was not the yellow oxide of lead, but probably a kind of frit like the composition called Mastichot, or Massicot, by the Dutch.

The colour with which the vases of Majolica and Damascus were painted is also described. These vases were known in Italy in the beginning of the fifteenth century. They are mentioned by Cennini as well as by the author of this MS., and in neither case as novelties.

Vasari attributes the invention of glazing pottery with a vitreous glaze, composed of tin, litharge, antimony, and other materials, to Luca della Robbia; now many of the glazes mentioned in this MS. contain tin and litharge [terragnetta], but none contain antimony. It is also worthy of remark, that one of the recipes teaches how to make blue in relief in the *Florentine* method. Some of these recipes may, therefore, have been similar to those used, or invented, by Luca della Robbia.¹ They certainly existed in Italy during the

¹ Vasari (vol. ii. p. 47) says Luca was born at Florence in 1388. Passeri also (*Storia delle Pitture in Majolica fatte in Pesaro e ne' luoghi circonvicini*) attributes the invention of this art to Luca; others, observes Lanzi,

period when Luca was living, and are not mentioned as new inventions.

“Les pièces d’art,” says M. de Brongniart, in his *Traité des Arts Céramiques*,¹ “dues à cette famille d’artistes Faienciers”² [the family of Luca], ont pour gla-

vol. ii. p. 118, say the art was brought from China, whence it passed into the island of Majorca, and from thence into Italy, where it was principally cultivated in the state of Urbino. It was employed not only for vases and table-services, but also for statues and groups in relievo, some of which were coloured. The art reached the highest point of perfection in the period between 1540 and 1560. During this short interval were executed the most beautiful vases and table-services that were ever made of this material. (See De Brongniart, *Traité des Arts Céramiques*, p. 58.) In the early part of the fifteenth century Giorgio Andreoli, commonly called Maestro Giorgio, invented the beautiful ruby red colour which is seen on pottery of this period. He worked at Gubbio between 1511 and 1537. The Duke Guidobaldo of Urbino took great interest in this art, and maintained a factory of it at his own expense. In order to secure good designs he prohibited the artificers from designing the works themselves, and compelled them to use prints after great artists, and especially after Raffaello; and this gave rise, observes Lanzi, to certain reports concerning this artist and his father, and the nickname of the “Boccalajo di Urbino,” which was given to the great painter.^a Many designs of Michael Angelo, of Raffaello del Colle, and other great artists, were executed in this material, and many painters were employed in making designs purposely for it; and Taddeo Zuccaro relates, that the designs for the service made for Philip II. of Spain were by Batista Franco. Services were made also for Charles the Fifth and other princes; and they were held in such esteem that Christina of Sweden offered to replace with silver vessels those which are now in the S. Casa at Loreto, which she desired to possess. See Lanzi, vol. ii. p. 117—120. De Brongniart, *Traité des Arts Céramiques*, pp. 55—59.

¹ See *Traité des Arts Céramiques ou des Poteries considérées dans leur histoire, leur pratique, et leur théorie*. Par Alex. Brongniart. 2 vols. 8vo. Paris, pp. 55—57.

² The French term “fayence,” earthenware, was derived from Faenza, in Italy, where it was formerly made.

^a Another reason for this appellation was, that one of the most skilful painters of this porceïain was also called Raffaello—his surname was Ciarla. His works then were truly said to have been painted by Raffaello, and the vulgar supposed they were by Raffaello Sanzio. See Lanzi, vol. ii. p. 119, n.

çure un véritable émail stannifère, bien glacé, dur, sans gerçure.” The principal colours employed are, according to the same writer:—

A tolerably pure yellow, produced by lead and antimony.

An opaque, pure, and dark blue; sometimes like enamel, sometimes as if applied on the surface.

Copper green.

The dirty violet from Manganese.

He adds, “These baked earths, with ornaments in relief of white and coloured enamels, were, for some time, the only coloured stanniferous pottery made in Italy. The manufacture of this varnished pottery, which Passeri calls ‘semi-porcelain,’ is still continued at Pesaro. This glazing was very beautiful.”

It is evident that the pottery described by M. de Brongniart resembles that for which the recipes are given in the MS. They have the same ornaments in relief of white and colours, and the colours used appear to be nearly the same.

The principal variation is in the yellow, which De Brongniart states consisted of lead and antimony; but he does not add that this statement is the result of analysis; and he may have named antimony on the authority of Vasari, who wrote above 100 years after the death of Luca, and who might therefore have been deceived as to the time when antimony was first used. It will be seen by referring to the MS., that the yellows were produced by lead (see Nos. 298, 299), and by silver (see No. 318).

The pure, dark, opaque blue appears to have been ultramarine. In No. 303, the blue colouring matter is called Zafirro, and in other recipes “azzurro” only; but

to judge from the colour and appearance of the blue on old Italian pottery, there is every probability that it was produced by ultramarine.

The copper greens are mentioned in Nos. 300, 301 ; the violet azure in No. 311. The latter was produced by adding Manganese to the azure.

This is the only colour approaching to red which is mentioned in these recipes, excepting that which may be produced by exposing "crocus martis" to the action of fire, for the colouring of the Damascus or Majolica vases. See No. 316.

The recipe in No. 284, for making a baked vase white without painting it, is worthy of notice as a historical fact ; because Passeri, the great authority on this subject, says, "It was only towards the year 1500, that the idea occurred at Pesaro, of employing this stanniferous glaze, as the glazing of earthenware, and as the white ground, on which were executed those beautiful paintings, which have given so much celebrity to this pottery, under the name of Majolica, and even under that of porcelain, a name which it owes to the beauty of its enamel."

It is singular that although the author treats of making artificial gems of glass, of Mosaics, and of glazes for pottery, he should have omitted to treat of painting on glass¹ for windows ; which was certainly known long previous to the date of this MS.,² and which was practised at this period in England, France, Flanders, Germany, and in some parts of Italy.

¹ Unless windows may be included under the head of "any other works in glass," in No. 270.

² See the MSS. of Theophilus, Book ii., and of Eraclius.

On looking, however, into the early history of Bologna, it will be found that the most ancient painted glass in that city (which is in the Church of S. Petronio) was not executed until the middle, or end, of the fifteenth century (consequently after the date of this MS.) by a lay Dominican, Beato Giacomo da Ulmo,¹ who was much addicted to painting, or, as it was then called, "writing" on glass; and who "was the only person at that period who practised this art in Bologna."

But although our author does not mention painted glass windows, he mentions three substitutes, or imitations, which, he says, "will appear like real glass." The first² consists of parchment, which is to be painted, and then varnished on the painted side; the second of parchment painted, and then covered with a ~~couch~~ of linseed oil; the third of linen also painted, and varnished with Vernice Liquida.

It is not mentioned whether these windows were intended for churches or private houses.

The MS. concludes with a treatise on dyeing silks, thread, linen, and leather; on the last subject it is very voluminous. To these are added a few miscellaneous recipes, among which are some for glues and cements of various kinds.

The unfinished Table of Contents is by another hand, probably of the seventeenth century.

¹ B. Giacomo was born at Ulm in Germany in 1407. In his youth his devotion led him to Rome, then he became a soldier. Afterwards he went to Bologna, where he assumed the habit of a lay Dominican, and gave himself up to painting on glass and working miracles. He died in the odour of sanctity in 1491. See the Guida di Bologna. Marchese, Vite de' Pittori, &c., Domenicani.

See No. 165.

SECRETS FOR COLOURS.

HERE BEGINS A TREATISE

ON PREPARING VARIOUS KINDS OF NATURAL AZURES. AND FIRST WE MUST TREAT OF THE KNOWLEDGE OF THE SPECIES AND NATURE OF THE UNDER-MENTIONED LAPIS LAZULI, FROM WHICH NATURAL AZURE, THAT IS, ULTRAMARINE AZURE IS MADE. AND I WILL DESCRIBE THE MODE OF TRYING THE STONE.

1. *To know the quality and nature of good stones without amalis.*¹—Know that lapis lazuli is a mineral stone which comes from beyond the sea. Many persons sell it in powder, and some sell it in entire pieces; it is of various sorts, and one stone may be of much greater value than another. Some stones are of a purple colour, and some of a dark violet, with red veins, and in some of the crevices is red earth; and this stone is not so brilliant as smalt.² And if its vein is white, or if there should be no spots of white here and there upon it, and if it should break easily, such stones are not very fine, because you cannot extract from them more than half their weight of fine azure; and in exchanging these stones you lose a great deal, therefore none will trouble themselves about them but those that are unpractised. Many say that the best lapis lazuli is a stone of a blue colour, which appears to have something of a violet tinge, with vein-like spots of gold in it; and it is mixed with a whitish stone, and is very hard to break. And observe that the following is the test by which to distinguish the good from the bad:—First take a piece of the stone and

¹ Amalis. Query, Amulets or Charms?

² It is almost unnecessary to observe that the colour we call Smalt was not known until long after the date of this MS.; I have, however, retained

SEGRETI PER COLORI.

INCIPIIT TRATATUS

DE MULTIS ET DIVERSIS AZURRIS NATURALIBUS FIENDIS. ET PRIMO DICENDUM EST DE COGNITIONE SPETIE ET NATURA SUBSCRIPTI LAPIDIS LAZULII EX QUO FIT AZURRUM NATURALE SCILICET AZURRUM OLTRAMARINUM. ET DICAM DE PROBATIONE IPSIUS LAPIDIS.

1. *Ad cognoscendum qualitatem et naturam bonorum lapidum ab aliis sine amalis.*—Sappi che lo lapis lazuli e una petra de minera che vieni ultra mare. Molti la vendino impolvere e alcuni la vendino impezi integri e sonno de piu ragioni e de molto piu fia una pretra che un altra. Alcune petre sonno de colore pavonazo, alcune de colore violato scuro e tiene la sua vena de rosso e in alcuni de li suoi canthoni hala terra rossa e non e la dicta petra troppo splendente quemadmodum de smalto. E se la sua vena fusse bianca o non fusse in qua e in la alcuna gocia de bianco e sia tenera a rompere : queste cotale petre non sonno troppo fini perche non se ne po cavare oltra a la meza de bono azurro e a mercatare queste cotale petre se ne scapita in grosso impero non se ne vole impaciare che qualunque non ha bona pratica. Molti dicano che lo lapis lazuli optimo e una petra che celistrineggia e pare che tenga in se uono colore violato cum sentille di vene doro e ha misture de petre bianchette e de asa ben dura a romperla. E nota che questa e la sperientia de sapere quale sonno bone e quale sonno rei. Prima tolli uno pezo de le dicte petre e metila in nel

the name for want of a better term. I consider it to mean those coloured glasses, or enamels, mentioned in the MS. of the Marciana, No. 325, which were brought from Germany, and which were used in painting on glass.

put it into the fire, and let it become quite red hot, then take it out and let it cool by itself; and when it is cold, if the stone retains its colour and does not become pale, it is good. But if it both improves and retains its colour, it is both good and perfect. As for those stones which change the beauty of their primitive colour, we must consider how many degrees they have changed, because there are some stones which the more they lose the finer they are. And let us suppose that the loss of colour does not proceed from the quantity of earthy matter contained in the stone, that is to say, that what azure it does contain is of good quality. But if it should proceed from the mixtures which are contained in the stone, we must nevertheless consider the difference made by this loss of colour, because it will yield less; and this is known by its not being of an uniform colour after it has been in the fire, but retaining its colour better in one part than in another. If it happens that the stone loses all its colour, then from whatever part it may have been dug, it is not ultramarine and is not fine, and consequently you cannot procure ultramarine azure from it, because the base of the azure, that is the stone, is not ultramarine. And even if it were ultramarine, it may contain so little substance as not to make it worth while to work it, because you would spend money without any advantage whatsoever; and the price of these stones in Italy commonly varies from 2 to 5 ducats a pound, according as they are more or less fine.

2. *To distinguish German or Teutonic azure from the other; and some notice of the stone from which this German azure is made.*—Know that the German azure is of several sorts, as is well known to those who have any knowledge and experience of it, because it usually contains in itself the stone from which this colour is made; it is partly of a pale and opaque blue, and partly earthy, of a yellow colour and frangible, so as to be broken by the nail; and these are the noblest azures of Germany that are found, and they usually appear somewhat translucent or transparent if you keep your eyes steadily fixed on them; but in this experience is the best guide. The value of

fuoco e farla ben infocare de vantagio poi il tra fuora e lassala fredare da se stessa e quando sera refredata se la dicta petra sta in suo colore che non smortisca e bona. Ma se migliorasse collore che lo mantenga e perfecta e bona. Ma quelle che mutano la bellezza dal primo collore e da considerar in quanti gradi se mutano per che ce sonno de quelle che quanto piu smontano tanto sonno piu fini. E poniamo che lo smontare non procedesse da la quantita de la terra de la petra cio e che quello cotanto che tene de azurro e de bona natura. Ma se procedesse dale misture che sonno cum la petra nondimeno e da fare la defirentia per lo callo imperho che renderia meno e questo se cognosce quando e stato in el fuoco non torna tuta duno collore, in alcun luoco se mantieni meglio che in uno altro. Ma se devinisse che la petra perdesse tutto el colore suo questa tale petra de qualunque parte fussero cavate non sonno de ultramar e non sonno fini e per consequentia non ne poresti cavare azurro ultramarino perche lo suo fondamento cio e la petra non e de de ultramar. E ben che fussero de ultramar possino tenere tanto poco de substantia che non seria da impaciarsine imperho che faresti la spesa senza utili alcuno e li pregi de le dicte petre in nele parte de ytalia communamente combatino da li doi ducati infino in cinque la libra e secondo che sonno più e meno belle.

2. *Ad cognoscendum azurrum almanicum sive Teothonicum ab alio et aliquam notitiam ipsius lapidis ex quo fit predictum azurrum almanicum.*—Sappi che lo azurro de la magna e de piu maineri secondo che ello e manifesto a chi de esso ha alcuna notitia e sperientia imperho che sole havere in se la petra che che se ne fa el dicto azurro parte de vena camillina e parte terra e de de collore croceo e sono frangibili a romperle cum l' ognia e quelli sono piu nobili azurri de lamagna che se trovino e soglino esse piu penetrabili e trasparenti a chi tiene ben gliochi fissi in questo la experientia da molto piu dotrina che altra cosa. E li pregi loro in partibus ytale combatano dali

these stones in Italy varies from 12 bolognini¹ a pound to 20 or even 30 bolognini, when they are of very good colour and appearance. And know that the price of the azures, when extracted and refined, commonly varies from 1 to 3 ducats the pound, more or less, according as they are more or less fine.

3. *Here begins the practice of extracting the azure from the lapis lazuli, and of refining it.*²—Azure is of two kinds, namely natural and artificial; it is refined in the following manner:—Take the stone, which is a mineral, and after washing it with ley, heat it on burning charcoal, and afterwards extinguish it in good and very strong white vinegar; then break it with a mallet on an iron anvil. Choose the good pieces, and grind them fine in a brass mortar well covered, lest the finer particles should escape; when very finely ground put the powder into an earthen dish and pour over it hot water or hot ley with a little honey and clay, rubbing the azure with your hands or with a stick, in order to extract the refined azure, and note that the water comes off of a green colour. Afterwards strain it through a linen cloth into a well-glazed earthenware basin,³ and pour off the water, or, still better, the ley, leaving the powder of the lapis lazuli settled in the basin; wash the azure with tepid but not hot water in a porphyry vessel, until the saline particles of the ley are washed away, and let the azure dry in the shade in the porphyry vessel; keep it in a bladder or in a purse of chamois leather: and note that if it is not of a good colour, or if it inclines to paleness, boil “Brasilwood”⁴ reduced to powder, in good ley or pure water, and then strain it through a cloth and put into it a little “alumen jameni,” or glasso,⁵ and mix with your azure already re-

¹ Bolognini, coins of the value of six quattrini, or a bajoccho, equal to an English halfpenny.

² There is another version of this chapter in a small MS. in the Bibliothèque Royale, at Paris, No. vi. MDCCXLIX. No. 9, entitled “Anonymous Tractatus de Coloribus.” The volume of which it forms part was dated 1481. The principal variations have been noticed.

12 bol la libra o ali vinti bol e per infino trenta bol la libra quando fussero avantagiati in colore et in apparentia. E sapi che li pregi de li azurri tracti e affinati comunamente combatino da uno ducato in fino a 3 ducati la libra e piu e meno secondo che sonno belli.

3. *Incipit practica ad extrahendum azurrum de lapide lazuli et ipsum affinando.*—Duplex est azurrum, scilicet naturale et artificiale et ipsorum vero affinatio in modo assignatur isto. Accipiatur lapidem istum qui est mineralis et igniatur post lavationem lexivii inter prunas ignitas postea extinguitur in perfecto et acerrimo aceto albo postea frange ipsum cum malleo in ferrea incudenea et elige bonas partes et subtiliter terrantur in mortario hereo optime coperto ne vapor ejus evalescat et cum fuerit per optime tritum ponatur in patella terrea et de super pone aquam calidam sive lexivium calidum cum modico melle obluto et ipsum azurrum manibus fricando vel cum baculo ut exeat azurrum afinatum et nota quod prædicta aqua efficitur viridis coloris postea cola per pannum lineum in lavella terrea ben vitriata post aquam sive lexivium quod melius est effundatur et pulvis lazuli in lavella residens postea ablue dictum lazulinum cum aqua tepida et non nimis calida in porfido donec salsedo lexivii exeat et permitte ipsum azurrum ad umbram siccari in prædicto porfido et servetur in visica in bursia camussi. Et nota quod si non est boni coloris vel tendens ad pallorem dequoque [Brasilium] in pulverem deductum in bono lixivio vel aqua pura postea per pannum cola et impone aliquantulum aluminis Jameni vel glasso, et

³ The Paris MS. has "patella ferrea bene plumbata."

⁴ Brasilium. The word has been supplied from the Paris MS.

⁵ The parallel passage in the Paris MS. has "Alumine glaro," which appears to be synonymous with roche alum. See Cennino, chap. lxiii., and the MS. of Le Begue, Nos. 42 and 299, where it is called "Alumen glacie" and "Alumen glarum;" and in No. 313 it is called simply "glace." I have little doubt that in all these passages roche alum is to be understood.

The term Alumen Jameni occurs in Geber's work on Alchemy. It also occurs in the Le Begue MS.

fined, and this gives it a good colour and will increase its weight.

4. *The mode of working the powder of the before-mentioned stone into the pastille.*—Take of mastic 1 lb., strained fine resin $\frac{1}{2}$ lb., soap from goat or mutton suet $\frac{1}{2}$ lb., new wax 2 lb., liquid varnish 2 lb., linseed oil 1 oz. First melt the wax and soap in a glazed jar, then the resin and the mastic in powder, and afterwards the varnish and oil, and mix them with a spatula so as to incorporate them, and afterwards try if the composition is well made and sufficiently thick by putting one drop into water; the mixture hardens if it is well done, if not, boil it until it becomes hard, which done, strain it through a linen cloth into a basin full of clear cold water and put it by. When you want to use it, take equal quantities of the pastille and of lapis lazuli, and incorporate your mineral, reduced into very fine powder, with the pastille; then put the pastille mixed with the powder into some glazed jar, and let the jar be half full of cold water, so that the water may cover the pastille by three fingers' width at the most, and let it remain in the water for 15 days, and the longer the better; afterwards remove the pastille from the water, and take good strong ley, which should be rather warm, and with it extract the azure from the pastille, rubbing it with your hands in a glazed jar, and pouring by degrees the warm ley over it; when you see the ley become blue pour it off by itself and put it into another glazed jar, and continue to do this until you have two other azures, not so fine as the first, and this you will know by experience. Then boil each sort separately with the ley and take off the scum neatly and carefully with a spoon; when you have done this let it stand for a day and a night until all the azure settles at the bottom; then separate the ley from the azure with a sponge, and wash the azure with clean water until all the saltness of the ley is extracted from it, then let it rest and the azure will sink to the bottom; when settled pour off the water, let the azure dry in the shade, and afterwards keep it in lambskin or sheepskin, and take care not to expose it too much to the air.

misce cum tuo azurro jam affinato et per hoc dat bonum colorem et augmentabitur in pondere.

4. *Modus autem ponendi dictum pulverem ipsius lapidis in pastillum.*—Accipe de mastice lb. unam, ragia pini collata lb. mediam, et de sapone caprino vel aretino lb. mediam, cera nova lb. duas, vernicis liquidæ lb. duas, olei seminis lini oz. 1; primo funde ceram et saponem in olla vitriata postea pone ragiam et pulverem masticis postea vernicis et olei et cum spatula misce ut incorporantur postea tenta si fuerit cottum et spissum dico ponendo guttam unam in aquam si firmatur bene est si non coque ut dum firmatur quo viso cola per pannum lini in quodam vase pleno aqua clara et frigida et serva quum volueris eo uti accipe tantum de dicto pastillo quantum de pulvere lapidis et incorpora mineram tuam in subtilissimam pulverem reductam cum prædicto pastillo postea mite dictum pastillum cum dicto pulvere mistum in quodam vase vitriato et in dicto vase sit aquam claram usque ad medium vel tribus digitis ad plus supra pastillum et dimite stare in dita aqua per 15^{im} dies et quanto plus tanto melius postea extrahe dictum pastillum de dicta aqua et habeas lescivium bonum et forte et cum dicto lescivio aliquantulum calido extrahe azurrum de dicto pastillo et ipsum manibus fricando in alico vase vitriato et paulatim de dicto lescivio calido desuper mitendo et quando videbis azurrum extrahe de per se et mite in alio vase vitriato et sic continua donec habeas alios duos azurros variatos non ita bonos quam primum et demonstrabitur per experientiam et cum dicto lescivio facias aliquantulum bulire quemlibet sortem de per se et cum uno coclario accipias spumam suavis et ingeniose et quando erit sic operatum permicte sic stare per diem et noctem donec totum azurrum petat fundum postea sepe lescivium ab azurro cum spongia et ablue dictum azurrum cum clara aqua donec omnis salsedo lescivii exseat et permicte possare donec azurrum petat fundum postea eice aquam sopstantem et dictum azurrum permicte sicari ad humbram postea conserva eum in corio agnilino vel aretino et cave ne ayer nimis tanget eum. Et intellige quod azurrum ultramarinum

And know that citramarine¹ azure must be refined by a ley and not by a pastille, because it is coarse and not heavy, and cannot be extracted in any manner by means of a pastille, or otherwise than by a good ley impregnated with Roman soap, and this ultramarine, or German or Spanish azure, or that which is brought from Lombardy, is refined in the following manner by means of a ley. Take very clear ley made from the sifted ashes of brushwood* and dissolve a considerable quantity of Roman soap so as to make it very viscid, put your mineral reduced to a very fine powder into the ley and afterwards make it boil a little over the fire; stir it gently with a spoon, then, pouring off the ley by degrees, you will find a very beautiful refined azure at the bottom of the jar; afterwards wash it with pure water, to remove the viscosity, and strain it through a linen cloth, and you will have natural azure.

5. *Another sort of pastille is made thus.*—Take of the best dried pine resin 6 oz., mastic 6 oz., of new wax 2 oz., of linseed oil 4 oz.; put all these things upon the fire, and do with everything as you were directed to do for the other pastille. When you wish to incorporate the pastille with the powder directly, take the pastille out of the water and rub it well in your hands, which you must grease with linseed oil. If the pastille spreads well, it is right; if not, repeat the boiling until you can spread it out well, and knead it like wax; then take a porphyry slab, oil it with linseed oil, spread out the pastille flat upon it, and immediately sprinkle over it some of the powder of lapis lazuli, kneading it up with your hands until one pound of the powder is kneaded up with 16 oz. of the pastille, then put the pastille, together with the powder, into cold water in any glazed jar, and let it remain as before in

¹ This part of the chapter is nearly a transcript of part of the Paris MS. before mentioned.

I have supplied the word "Citramarine" from the Paris MS., which appears the most correct. In the first part of the Bolognese MS., the author has described the method of preparing the true Ultramarine, or Azurum Transmarinum, with the pastille; but he is now speaking of another kind of azure, for which a ley was to be used instead of a pastille. This last

debet debet affinari per capitellum et non per pastillum: quia grossum est et non ponderosum nullo modo extrahitur pastillo nisi bono capitello saponem romano infecto et dictum azurrum ultramarinum vel almaneam vel ispaneum vel de lombardia aportatum affinatur hoc modo per viam capitelli. Acipe lescivium de cineribus crebellatis et sit bene clarum in quo dissolve saponem romanum in bona quantitate ut sit bene viscosum in quo pone mineram tuam in subtilissimam pulverem reductam postea ad ignem fatias aliquantulum bolire fatias et eum move plane et moderate cum spatula postea paulatim effuso capitello invenies azurrum pulcherrimum in fundo vasis affinatum postea eum lava cum pura aqua ut auferatur ab eo viscositas et postea colabis per pannum lineum et habebis azurrum valde naturalem.

5. *Aliam pastillum sic fit.*—Summe ragia pini optime sicce oz. 6, masticis oz. 6, ceræ nove oz. 2, olei seminis lini oz. 4, hæc omnia pone super ignem et fac per omnia ut supra habuisti in alio pastillo. Et quando vis dictum pastillum cum pulvere incorporare subito acipe dictum pastillum de aqua et ipsum ducas per manus multum bene perunta manus de oleo lini et si dictum pastillum bene extenderetur bene est si non reitera decotionem donec se possi bene extendere et ducere per manus sicut cera tunc habeas porfidum et undem unge cum oleo lini et de super pone dictum ditum pastillum extensum super dictum porfidum sic splanata et aspergas subito de dito pulvere lazuli desuper et ipsum manibus incorporando donec una libra dicti pulveris incorporetur cum sexdecim uncis dicti pastilli et hoc facto pone dictum pastillum cum pulvere incorporato in aqua frigida in quodam vase vitri-

azure, he says, was brought from "Almania ut de Anglia ut Ispanea seu Lombardia;" a proof that this pigment was not produced in Germany only. Cennini also speaks of its being found at Siena.

² Subcarbonas Potassæ imparus, Impure potash, or pearl-ash. It is generally prepared by burning land plants, or wood; in Italy vine branches were generally used for this purpose.

another pastille not so good, and do as before ; and note that if you wish to colour the azure, take a little spirit of wine and put it into the water with some good verzino ; but this does not belong to the art of preparing azure.

6. *To extract the gold from the lapis lazuli.*¹—Take the before-mentioned mineral lapis lazuli, and break it on an anvil or in a covered brass mortar, and put it in a basin of cold water, and you will see that it has veins of gold, and that sort is good. If you want the gold, pick it out piece by piece.

7. *To make good azure and refine it by means of a pastille.*—Take as much lapis lazuli as you like and pound it very finely and carefully in a brass mortar, afterwards grind it on porphyry with clear water so as to become almost impalpable, because in this state it will work better, and let it dry.

8. *The manner of working the before-mentioned azure into a pastille.*—Take for every pound of lard, one pound of pine resin and one ounce of Spanish pitch ; then take a jar, free from fat, and melt the lard in it, and when it is melted and strained add clean pine resin, and mix it well, so that the ingredients may be incorporated together, afterwards add the Spanish pitch ; mix all thoroughly together, and let the mixture be as liquid as water. Then pour upon it a little common oil, or linseed oil, and remove the jar from the fire, continually stirring it with the stick while it is cooling. When you wish to put the powder of the lapis lazuli into this pastille, take equal quantities of the pastille and of the stone reduced to powder, and melt the pastille over the fire in a glazed vessel, and when it is liquid like water put your stone into it, and mix it well with a stick ; afterwards take it away from the fire, and let it remain from evening to morning, or even longer ; then heat it at the fire until nearly liquefied. You must place by the fire a pot full of water, tepid, but not hot, in which you must put the pastille for a short time, then take a glazed jar

¹ Gold is not actually found in the Lapis Lazuli ; but the spots and veins which resemble this mineral consist of sulphuret of iron, which is always more or less present in the mineral. The Romans called the Lapis Lazuli

ato et permittite stare ut supra in alio pastillo non tam bono et sequere ut supra. Et nota quod si vis ipsum collorare acipere modicum aquæ ardentis et intus in ipsa aqua pone aliquantulum de virzino bono tamen non est de arte azurorum.

6. *A cavar loro de lo lapis lazuli.*—Accipe dictum lapidem mineralem lazurrinum et eum frange in ancudenea sive in mortare hereo coperto et pone ipso in quodam vase ut sit de aqua frigida et videbis venas aureas habentes et illud est bonum. Et si vis aurum acipe ipsum paulatim paulatim.

7. *Affare azurro bono et afinarlo per via de pastillo, viz.*—Recipe de lapide lazuli quantum vis et eum pista in mortareo hereo valde bene et caute postea macina ipsum in porfido cum clara aqua quantum potest ut veniat subtile quasi sine tacta quia melius operabit deinde demicte eum sicari.

8. *Modus ponendi sopradictum azurrum in pastillum.*—Summe per omni libra lardi lb. unam ragia pini et et untiam unam pegule spagnole postea habeas ollam unam multum nitidam a pinguedine deinde mitte lardum dictum in ditta olla ad colandum et quando colatum fuerit tunc mite ragia pini munda et mistica bene ut incorporantur postea impone desuper dictam pegulam spagnolam et insimul incorpora valde bene ut deveniat sicut aqua deinde impone desuper aliquantulum olei communis vel seminis lini postea remove dictam ollam ab igne semper mistando cum baculo dum refrigiatur. Et quando vis mittere dictum pulverem lapidis lazuli in hunc pastillum accipe tanto de dicto pastillo quanto de dicto lapide in pulverem reddito deinde recipe dictum pastillum et mitte eum ad ignem ad liquefaciendum in quodam vase vitriato e cum liquefactum fuerit ad modum aquæ tunc impone lapidem tuum et mistica bene cum uno baculo postea sepe eum ab igne et dimitte sic stare a sero usque ad mane vel plus deinde calefac eum ad ignem ut deveniat quasi liquidum et habeas ad ignem ollam unam aquæ plenam dico quod aqua sit tepida et non

of this description, Saphirus Regius, under the supposition that it contained gold. See Bachhoffner, Chemistry applied to the Arts.

with hot water and pour it on to the pastille, mixing it continually; and as the pastille loses its azure, keep continually adding hot water; and note, that if the pastille should break, you must not knead it, but let it stand a little, and pour off the water from the pastille, then pour some other hotter water on the pastille, in the manner you did before, and mix it: and observe, that when the azure changes colour, you must immediately pour off the coloured water into another vase; and it will be of less value than the first. If you choose to return this into the first pastille another time, then it will come out like the first azure; and know, that when you take the second azure extracted from the pastille, you can put it back a second time, and it will come out a better azure. And note also, that all the powders of lapis lazuli, when they are put into the pastille, diminish and lose one half. If you wish to extract completely the whole of your azure from the pastille, make it boil in ley until the pastille becomes white, and then prepare it in this way:—Take the first jar (and do the same with the others) and strain the contents into another jar through a thick piece of white linen cloth; then take another clean jar and rub the piece of linen to and fro upon the bottom of it, and all the good azure will be extracted: if it were squeezed, the azure would get into the pores of the linen. Then pour it into that which has been strained through the linen, and let it settle until it all sinks to the bottom; throw away the water, and heat the powder with clear ley so that it may boil a little; then throw it into another jar, and let it rest until it sinks to the bottom; next take out the ley dexterously and cautiously with a sponge, and pour clean water into it and mix it well. Then let it stand, and take out the water in the same way that you did the ley, and let it dry in the shade, and keep it in a purse.

9. *To make ultramarine azure another way.*—Take the mineral stone of the lapis lazuli, which has veins of gold, and which is of a blue colour, and this is the finest sort. Divide the stones into three classes; and first select the cleanest and

calida et in ipsa olla cum aqua tepida mite aliquantulum dictum pastillum postea habeas catinum unum vitriatum cum aqua calida et mite intus dictum pastillum semper misticando et quando pastillum deficit de azurro renova semper aquam magis calidam. Et nota quod si pastillum frangeretur cave ne tu misticas sed dimete ipsum stare aliquantulum et separa aquam a pastillo et desuper pastillum impone de alia aqua magis calida per supradictum modum et mistica. Et nota quod quando azurrum mutat colorem statim sepe aquam azurrinam in alio vase et erit minoris pretii quam primum. Et si vis retornare aliam vicem in pastillo primo dum supra-dictum veniet ut primum azurrum. Et intelige quando tu accipias azurum secundum extractum de pastillo tu potest eum remictere alia vice in pastillo veniet tibi meliorem azurrum. Et nota quod omnes pulveres lapidum lazulorum ut mictantur in pastillum deficiunt et callant per medium et si vis extrahere penitus azurrum de pastillo fac eum bullire in lexivio dummodo pastillus deveniat albus postea acipe azurrum illum et eum quoque per hunc modum acipe primum catinum et sic reitera cum aliis et cola in uno alio catino per unam petiam spissam panni lini albam et acipe alterum catinum netidum e poi mena la dita peza suso per li fondi e tuto lo azurro buono uscira fuora perchè se se stringesse intraria in la peza e poi metilo in quello che sia colato con la peza e poi lo lassa posare infino che e tutto al fondo poi gietta via laqua et fallo bulire cum liscia chiara tanto che bolla uno poco poi giettalo in uno catino e lassalo possare tanto che vada al fondo poi cava la liscia fuora dextramente et ingeniose cum una spongna poi mecti dentro de laqua chiara e misticalo bene poi lassa posare e cava fora laqua per lo modo che cavasti la liscia poi lassalo secare a lombra et servalo in bursia.

9. *Affare azurro ultramarinum per alium modum.*—Tolli de la petra minerale de lo lapis lazuli la quale tene de vene doro e de di collore cillistrino e quella e la più fina della quale preta ne farai tre sorte prima elleggio le piu necte e le piu

finest, which contain no stone or earth ; second, choose those that are of the middling sort ; and, thirdly, those that remain, which belong to the third sort ; and put each sort by itself. Then put those which you wish to use into a crucible, cover it with a tile, and put it on a charcoal fire or in a hot oven for a whole day ; then quench the stone in hot vinegar, and afterwards pound it in a bronze mortar, well covered, and sift it very fine. Then put the azure into a glazed jar with pure water, and stir it with your hand or with a stick, and let it rest. Remove the water carefully with a sponge, then grind the azure well on a porphyry slab, and afterwards put it into pure water in a jar, and stir it well with a stick. Then let it rest for the space of a *pater noster*, after which pour that water into a clean glass, because the finest azure is that which will remain at the bottom. You must grind the inferior azure which remains a second time, as before. Then take out the coloured water and lay it aside, and do as before ; then grind it again, and do this until there remains no more azure, and when you have put away all the waters by themselves, let them settle well, so that all the azure may sink to the bottom and the water remain clear above. Then take off the water with a sponge as before, and when you have completely removed it, wash the azure with tepid caustic ley¹, stir it well with a stick, let it settle, and then take out the ley as you did the water, and let it dry in the shade. This is the true preparation of ultramarine.

10. *Mode of making a pastille to extract the azure from the lapis lazuli.*—Take of pine resin oz. viij, Greek pitch oz. iiij, mastic half an ounce, linseed oil oz. ij ; then take a glazed pipkin, and put it upon a tripod over a slow and clear fire, and when it begins to get hot, put into it first the linseed oil, and let it warm a little ; then add the Greek pitch in powder, and incorporate it thoroughly with the oil, mixing it with a stick until it is done ; and you will know when it is done by trying it

¹ Ranno da Capo is probably the same as *Capitello*. The term *ranno* is Tuscan.

belle le quale non tengano de spetie de alcuna altra petra o vero de terra. Secundo eleggie la mezana sorte. Tertio eleggie quelle che avanzano che e la terza sorte e metti omni una da per se e poi meti quelle che tu voi lavorare in uno crugiolo e coprilo cum una tegola e mectilo al fuoco de carboni o vero in lo forno caldo tuto uno di e poi immortalato cum aceto forte poi lo pista in uno mortaro de bronzo ben coperto poi lo stamegna ben sotili e poi pone lo azuro in uno catino vitriato cum aqua pura e rimenalò cum mano o cum uno bastoni e lassalo ripossare poi cava lacqua con una spogna moderatamente poi torai lo azurro e macinalo sopra uno porfido molto bene poi lo porai in aqua pura in uno catino poilo rimena bene cum uno bastone poi lo lassa repossare per spatium duno pater nostro poi mecti quella aqua in uno vaso de vetro netto imperhoche lo azurro subtilissimo e quello che romara al fondo e quello azurro più grosso che te romara atritalo bene una altra volta commo prima e poi cava laqua azurra e mectila da parte e fa commo prima poi la trita de novo e cusi farai tante volte in fino a tanto che ce niente de azurro e quando tu haverai poste tutte laque da per se lassale ben possare si che tutto lo azurro vada al fondo e laqua remanga chiara de sopra

- poi cava laqua cum la spogna commo e di sopra ditto e quando laverai tucta cavata multo bene lava lo dito azurro cum lo ranno¹ da capo tepido e remenalò molto bene cum lo bastone e lassa possare poi cava la liscia commo laqua e lassa secare a lombra e questa e verissima preparatione.

10. *Pratica a fare pastillo per cavare lo azurro de lo dicto lapis lazuli.*—Piglia ragia de pino oz. viij. pece greca oz. iiij mastice onca meza olio de semi de lino oz. ij poi tolli uno pignatto vitriato e pollo sopra a uno tre piei cum lo fuoco sotto lento e chiaro e commo comincia ad esser caldo mectice prima lolio de semi de lino e lasselo uno poco scaldare poi ce pone la pece greca spolverizzata e incorpora multo bene cum lolio misticando cum uno bastoni per infino che sera cotto che lo

¹ Liscivio.

in the same manner as you tried the first-mentioned pastille. Then strain it like the other, and when it is cooled in the water, put the pipkin on the fire as you did at first; and when it begins to get hot take oz. ij of linseed oil, and add to the said pastille, and when it is well melted, add an ounce of turpentine, always mixing it well; then take the pipkin, and while it is still boiling put oz. viij of the powder of the mineral, pounded very fine, by degrees into the pipkin, keeping it still boiling gently; then throw the pastille into cold and clear water in a basin, and when it is cold, grease your hands with linseed oil, and work the pastille about this way and that in your hands like dough; and when you have worked it sufficiently, put it back into the water, and let it stand several days, changing the water two or three times every day; and at the end of six days take the pastille, and some warm honey-water (that is, take ten measures of clear water and one of honey, and let them boil for the tenth part of an hour, scum well, and then strain the liquid through a linen cloth, and it is done); wash the pastille with the honey-water previously warmed, and extract the azure the first time; the second time let the honey-water be a little warmer, and the third time a little warmer still, as in the other recipe. And know that the first time it is very troublesome to extract, the second time it is easier, and the third time it is easier still; and the reason is, that each time the water is a little warmer; but take care not to have it quite so hot as to melt the pastille: if this should happen, cool it by throwing cold water over it. Take care that the water is tepid the first time, warmer the second time, and warmer still the third time, otherwise you will never be able to extract the azure.

11. *To make azure and to refine it well.*—Take lapis lazuli, and pound it in a bronze mortar as carefully as you can, in order that the powder may not escape, and when it is well pounded, if the powder is of a greenish colour, it must be ground upon a marble or porphyry slab with clear fine white honey; but if it is not of a greenish colour, grind it with strong

conoscerai in quando sera cotto al segno de laltro pastillo poi locola commo laltro e quando sera freddo in laqua metti la pignata al fuoco commo fecisti prima e quando comincia a scaldarse tolli oz. ij. de semi de lino e poi meti el dicto pastillo e quando sara ben disfatto mettivi una oncia di trementina sempre menando bene poi tolli la pignatta e cusi bolendo mettivi oz. viij. de polvere de la dicta preta ben sotili a poco a poco ne la pignatta sempre bolendo competentemente poi gietta lo pastillo nella aqua fredda e necta in uno catino e quando sera freddo ogniti le mano cum olio de lino e tolli lo pastillo e tiralo in qua e in la in mano commo pasta e quando laverai ben menato remetilo in la sua aqua e lassalo stare alcuni di e ongni di li muti laqua doi o tre volte e in capo de vj di tolli lo pastillo e cum laqua de mele calda cio e tolli x. mesure de aqua chiara e una de mele e bolla la decima parte de hora una e schiumala bene poi la cola cum panno de lino e de fatta e lava lo dicto pastillo cum la dicta aqua de meli calda e cava lo azurro la prima volta la seconda volta sia uno poco piu calda e la terza uno poco piu commo ne l' altra pratica. E sapi che la prima volta e grande fatica a cavarlo in la seconda meglio e in la terza meglio la ragione e che omni volta laqua e uno poco piu calda ma guarda che non fusse in tuto tanto calda che lo pastillo se disolvesse e se purre ocurisse aiutalo getando supra de laqua fredda. E habbi cura che la prima aqua sia tepida la seconda piu la terza piu imperhoche altramenti non lo caveresti mai.

11. *Affare azurro e afinarlo bene.*—Torrai la petra lazuli e pistala in uno mortaro di bronzo piu cautamente che tu poi acio non sfuata e quando sera ben pisto se questa polvere ha vera colore verde sci e da macinare sopra lo marmo o porfido cum lo mele chiaro e bello e bianco. Ma se non tene de colore verde macinalo cum aqua gommata ben forte sopra porfido

gum water upon porphyry until it becomes almost impalpable like ointment, and then put it into a glazed jar, and pour over it a sufficient quantity of strong white wine vinegar to cover it; mix it well and let it stand 4 or 5 hours, then pour off the vinegar carefully from it, and wash the azure with fresh water 3 or 4 times, or until it comes off clear, and then incline the basin to the rays of the sun so that the water may dry up completely. The azure must then be treated as follows: take a new pipkin with a little pine resin, a little new wax, a little common oil, and a little white wine at discretion. Mix up these things with the azure, so that it may become liquid like honey, first straining the pastille through a linen cloth, and then pouring it by degrees on to the azure, mixing it up well with a stick; take care to have plenty of the pastille, so that there may be no want of it; for if there should not be enough, the azure would be lost; then put the paste with the azure incorporated with it, upon a linen cloth, coarse but loosely woven, which must also be damped, and put it into a basin of clear water, and take up all the corners of the cloth in your hand, leaving the azure in the middle of it, and move the cloth about backwards and forwards as if you wished to sift it under the water. It must then be strained again through a coarse cloth, from which it will press out like pills, and the earth and the impurities will all go to the bottom, and that will show when the azure is well cleaned. You must put the mass of azure into a coarse linen cloth spread out, and then take up the corners of it all together, and keep continually moving the azure about with your hand, and there will remain good and excellent azure in the cloth; then put it little by little carefully into a clean vase, and you must mix up with the azure enough common oil to make it liquid, so that it may appear to be all oil, and putting it upon the fire, add to it a little white soap, well thinned and beaten up, for the space of two pater-nosters; then pour in the soap ley and beat the whole well together. When the composition is well boiled put it into a small bag made of horsehair like a sieve, rub it well with

tanto che venga quasi impalpabili ad modo de onguento di poi lo metti in uno catino vitriato e metice di sopra tanta quantita daceto forte di vino bianco che la materia venga coperta e mistica bene e lassa cusci stare per 4 o 5 hore da poi ne cava lo aceto cautamente e lava la materia cum aqua fresca 3 o 4 volte o per infino che se schiare da poi inchina lo catino al raggio del sole che nescha totalmente laqua de poi se vole acconciar el dicto azurro in questo modo tolli una pignatta nova cum un poco di ragia di pino e uno poco de cera nova e uno poco dolio comuno e uno poco de vino bianco a tua descrittione e tucte queste cose incorpora cum lo dicto azurro per modo che vegna liquido commo mele e cola prima la dicta matheria cum panno de lino poi la pone sopra a lo azurro a poco a poco incorporando bene cum uno bastone e fa che magiormente habunda la dicta matheria che non manca per che se manchasse alcuna parte lo azurro se perderia e alhora pone la dicta matheria cum lo azurro incorporato sopra a uno panno de lino grosso e raro de trama e sia humido e ponilo al catino de laqua chiara pieno alhora tene el dicto panno de ongni capo cum mano e lo azurro in mezo del dicto panno e va menando el panno in la e in qua commo volesti crevellate infra doi aque e alhora la dicta matheria se vole arecolare per uno panno frugato che vegna commo pilole e la terra e la feccia vada tucta in fundo del catino e alhora sera signo che lo azurro sera ben purgato e la dicta adunatione de lo azurro se vole porre in uno panno de lino frustro seperato in qua e in la e adunnalo tucto insieme e mai se vole cessare de menare le mano per lo dicto azurro e rimara optimo e buono azurro in el panno e subito remitilo in uno vaso necto a poco a poco e vol se incorporare cum lo dicto azurro de lolio comuno tanto che sia bene liquido e quasi tutto olio e stando sopra al foco mettime uno poco de sapone bianco molto ben asotigliato e bactuto per doi patri nostri alhora fortemente pone el capitello insieme li rompe e poi quando sera ben cotta la dicta matheria in uno sachetto facto de pelo de cavallo ad modo stacia e sempre sfregando cum mano, overo cum doi bastone da poi pone in el sachetto el

your hand or with two sticks, and put the ley into the bag; rub it so that all the azure may be pressed out, and then wash the azure with a ley made of the ashes of vine branches, and having done this two or three times, put it to dry in the shade, in whatever way you like, and when it is quite dry, if it should not be of a good colour, you must proceed in the following manner.

12. *To give a good and fine colour to the azure, when it is not well coloured.*—Take several eggs, and make them boil till they become hard, then open the eggs in the middle with a knife, take away the yolk, and fill up the hard white of the eggs with sal ammoniac in very fine powder; then cover it with the other parts of the eggs, and tie them so that they will not come open, and put them in a new glazed jar for one night in a place which is very damp; in the morning you will have a water made from the sal ammoniac, which you must pour upon the azure so that it is entirely covered with the water, and it will make the azure of a most beautiful colour, and of twice the value that it was before. Dry it in the shade, and keep it in a leather purse, or in a box, and expose it as little as possible to the air.

13. *How to prepare the azure and to work it into the pastille to refine it.*—Take the lapis lazuli which has golden veins; the deeper it is in colour, and the purer from other mixtures, the better, and of the more perfect kind it is. You must put it into a shell, and let it stand over a charcoal fire until it becomes red hot; then throw it into strong vinegar, and repeat this 3 or 4 times, each time making it red hot, and quenching it in fresh vinegar, because by calcination it is more easily pounded and reduced to powder. And if the lapis lazuli is not of a perfect sort, it must not be heated, because it will lose its colour, and know that it is much better to take the lapis lazuli pounded and reduced to powder, because you can see its colour better. But if it is in pieces, the pieces must be pounded in a bronze mortar, well covered, lest the powder should escape into the air; then you must grind the

capitello e sfregalo si che tucto lo azurro escha fuora de poi lava el dicto azurro cum lo capitello facto de sementi e facto questo doi o tre volte metilo a secare a lombra commo a te piace e quando sera ben secco se non havesse in tutto bello collore farai in questo modo commo seguitara di socto.

12. *A dare bono e bello collore a lo azurro quando non fusse bene collorato.*—Recipe parechi ova e falli tanto bollire che diventano duri de po apri li dicti ova per mezo cum uno cortello e leva via el torno giallo e impelo albumi duro de li dicti ova de polvere ben subtili de sale armoniaco e de poi copri con l'altra parte de li dicti ova e ligali bene che non se aprino e polli in una pignata vitriata nova per una nocti in loco che sia ben humido e la matina haverai laqua facta del sale armoniaco la quale porai sopra alo azurro in tanto che sia tutto coperto de la dicta aqua e renderalli beletissimo collore e doppio pregio che prima e seccalo a lombra e serbalo in saculo de curami in una scatola e fa che senta meno haiere che poi.

13. *Pratica a sapere fare la preparazione de lo azurro e porlo in lo pastillo per affinarlo.*—Accipe la preta de lo lapis lazuli che habia vene doro e quanto e de piu pino collore e necto da laltre misture tanto e migliore e de piu perfecta sorta lo poi ponere in uno coccio e lassa la tanto stare sopra al fuoco de carboni che diventi bene infocata e rosscia e cosi infocata gietala in lo aceto forte e cosi farai 3 o 4 volte omne volta reinfocandola e spingendola in nuovo aceto bianco perche lo calcina meglio per poterla pastare e redurla in polvere. E se lo lapis lazuli non fusse de perfecta sorte non se vole infocare perche perderia lo collore E sappi che e molto meglio torre lo lapis lazuli pisto e reduto in polvere perche se vede meglio de che collore le. Ma se sonno in pezi se vogliano pistare nel mortare de bronzo coperto multo bene perche la polvere non valesca al vento poi lo macina sopra al porfido e quando sara

powder upon porphyry, and when it is very fine, let it dry. When dry, you may grind it with ley or with tragacanth, because this makes it more easy to grind, and let it dry; and so much for the preparation of the lapis lazuli.

14. *The way to make the pastille, and to refine the before-mentioned lapis lazuli.*—Take 3 oz. of pine resin, oz. j of Spanish pitch, oz. j of mastic, oz. j of linseed, and put it all over the fire in a glazed pipkin to boil slowly together, and let the composition boil until a drop of it thrown into cold water, and taken up in your wet fingers, ceases to stick to your fingers, when it is done. Then take it from the fire and immediately strain it through a cloth, receiving it in a basin of cold water; when the pastille is hardened, grease your hands with linseed oil, and take the composition, and pull it to and fro like bird-lime; then make it into a cake, and you can then keep it a long time, either in or out of water, and so much for the preparation of the pastille.

15. *The way to incorporate the pounded lapis lazuli with the pastille to refine it well.*—Take of the powder of the lapis lazuli one pound for every 10 oz. of the pastille, and put the pastille into a glazed pipkin and make it almost boil; then take the powder and put a little at a time into the pipkin, and mix it well together with a stick, and throw the mixture while hot into a basin of cold water; then oil your hands with linseed oil, as you did before, and knead the paste very well in order to incorporate the ingredients thoroughly together; then make them into a cake and put this back into a basin of clear cold water. You may keep it as long as you like, and you must keep it at least a fortnight; and so much for incorporating the powder with the pastille.

16. *The way to wash the powder out of the pastille to refine it.*—When you wish to extract the azure, put the pastille into a glazed pipkin, with tepid water; and there must be enough water to stand four fingers' breadths over the pastille; let it remain so for the space of ten paternosters, and then throw away that water, and add some more water to it, and do this three or

bene subtilissimo lassalo seccare e quando e secco lo poi macinare cum lisciva o vero cum draganti perche lo fa piu palpabili e lassalo seccare e questo e quanto ala preparatione de lo dicto lapis lazuli.

14. *El modo affare el pastillo e affinare la dicta preparatione de lo lapis lazuli supradicto.*—Recipe oz. 3 de ragia de pino oz. j de pece spagnola, oz. j de mastice, oz. j de semi de lino e metti omni cosa al foco in una pignatta vitriata a bulire pianamente e tanto bolla che gietandoni una goccia in aqua fredda e poi pigliandola cum li deta bagnati non se apicha ale deta alhora e cocta e cosci calda tolla dal fuoco e subito colala in uno panno e ricogliendolo in uno catino daqua fredda e quando el pastillo e ben indurato ongniti le mani cum lolio de semi di lino e piglia la dita compositione e tirala in la e in qua come se fa el vischio poi lo reduce ad modo duno pano e conservare el poi longho tempo o voli in aqua o senza aqua e questo basta a la compositione del pastillo.

15. *El modo da incorporare la sopradicta preta pista in lo pastillo per affinarla optimamente.*—Summe de la polve de lo dicto lapis lazuli per omne libra oz. x de lo dicto pastillo e mettilo in una pignatta vitriata e fallo tanto scaldare che sia per bollire alhora tolli lo dicto lapis in polvere e metilo a poco a poco in la pignatta e misticalo bene insieme cum uno bastone e gietalo cosi caldo in uno catino daqua fredda poi ongniti le mano cum lolio de semi de lino commo facesti la prima volta e tiralo molto bene acio se incorpora bene poi lo reduce commo uno pane e rimetilo in uno catino daqua fredda e chiara e poilo tenere quanto voli ma vole almanco stare per xv di naturali e questo basta in quanto alla incorporatione de la polvere.

16. *El modo da cavare la dicta polve de lo pastillo per afnarla.*—Quando voli cavare el sopradicto azurro del pastillo poni el dicto pastillo in uno catino vitriato e metivi de l'aqua tepida e e vole esser tanta aqua che stia 4 deta sopra al pastillo e lassalo cusci stare per dire X patri nostri poi sparge via quella aqua e metice de l'altra aqua calda e fa cusi iij o iiij volte

four times until the pastille is warmed through. Then take two clean sticks a foot long, and of the thickness of one finger, round at the ends; and with these sticks you must knead the pastille in the warm water, turning it inside out with the sticks and continue doing so, and changing the warm water, until the azure begins to come out of the pastille, and when the water is full of the azure, empty it into another basin, holding back the pastille in the basin with the sticks. Then pour some hotter water over it, and continue to do so until all the azure is extracted. When you see the ashes, which are of a dull colour, work out, put them away into another vase, because they are not good, compared with the first sort. Pour the 3 or 4 first washings into the first basin, and as many more into the second, and all the rest in the third basin. The first will be of a fuller colour, but not so finely pulverized; and the second will be of a very good colour, but not like the first, and the third will be of a whitish colour and very finely pulverized. Then put each sort by itself, and take out the water, then clean the azure with eggs, beaten up with the branch of a fig-tree, and make the azure into a paste with these beaten eggs; then wash the azure with clear and weak ley until the ley comes off clear, frequently renewing the ley, and then dry the azure in the shade, out of the way of dust, and keep it in a little bag of chamois leather.

17. *The way to make "azurro di lamagna," or German azure, or Spanish azure, and to refine it well.*—Take the mineral stone of the colour of smalt, or of a yellow colour, break it in pieces, and free it from other mixtures and impurities, and then pound it very fine in a bronze mortar, covered over, in order that the powder may not escape and be blown into the air, and sift it with a very fine sieve. Then take very strong and clear ley, made from baked ashes, with which you must wash the powder of the lapis lazuli four or five times, and receive all the waters in a basin, and pour the ley carefully off the azure, which will settle at the bottom of the basin. Then take very clean and white honey, and grind up the azure with the honey, a little at

tanto che el pastillo se scalde de dentro poi tolli doi bastoni longhi mezbocracio e grossi uno deto polliti e necti per tutto e tondi in capo e cum questi bastone se vole cemenare el dicto pastillo nela dicta aqua calda e revoltando quello dentro de fora cum li dicti bastoni e tanto farai cusci scambiando laqua calda per infino che lo azurro cominciarà ad huscire fora del pastillo e quando laqua e ben piena de azurro voita quella aqua azzurra in uno altro catino retinendo el pastillo nel fondo del catino cum li dicti bastoni poi li rimecte suso del aqua piu calda e tanto fa cusci che nescha fora tucto lo azurro e quando tu vedrai uscire fora el cinaraccio che e di colore smorto metilo da parte in uno altro vaso perche non e buono apresso quello de prima. Mecti la prima lavatura 3 o 4 volte nel catino e altratanto nel secondo e tucte l'altre nella terza sorte el primo sera piu pino de collore ma non sera cusi subtili e el secondo haverà assai buono collore ma non commo el primo e el terzo sera de collore bianchetto e sera sutilissimo poi metti cescuno da per se e cavarai laqua e poi purga lo azurro cum gli ova sbactuti cum una rama de fico e impasta lo dicto azurro cum questi ova sbattuti poi tolli liscia chiara e dolce e lava lo dicto azurro cum essa liscia tanto che la liscia nescha chiara renovando spesso la dicta liscia e poi lo pone a secare a lombra dove non vi vada polve e serba lo in saculo camusi.

17. *Pratica affare azurro de lamagna o vero azurro thodesco o vero azurro spagnolo e afinarlo ottimamente.*—Tolli de lo lapis minerali de collore de smalto, o vero de collore crocio e rompilo bene e acapalo de l'altre misture e immonditiū poi lo pista molto bene in uno mortaro de bronzo coperto primo che non sfuita et non vada la polvere alaiere poi lo staccia cum una stacia subtili de poi tolli liscia fortissima e chiara facta de cenere recotta cum la quale lava la polvere de lo ditto lapis in fino a quattro o cinque volte e coglie tutta la lavatura in uno catino e lassa bene scolare la liscia de lo azurro che stara in lo fondo del catino poi tolli del mele molto bene netto e bianco e vieni macinando lo dicto azurro allo dicto mele a pocho a poco

a time, on the porphyry slab, until it is ground fine ; then take four or five glazed basins, and put the azure into one basin, in which you must distemper it with strong ley, mixing it well with your hands ; when it is well mixed, pour it off very quickly into another vase, and continue washing it until the ley becomes clear, and let the coarse azure remain at the bottom ; then grind up again the coarse azure which you have left at the bottom, as you did before, and when it is ground put it with the first, and wash it all together as you did before. When you have washed it well, let it rest for the space of one *pater noster* ; then pour it off slowly into another basin, and wash it until you have washed away the fine parts. Then grind up the coarse parts as before mentioned, if you like, and mix all together, coarse and fine—that is to say, the first, second, and third washings ; and when you have washed the powder well, so that the ley separates entirely from it, let all the ley run off, and put the azure into a glazed pipkin, and pour over it strong white vinegar, so as to cover the azure, and as much common salt as is sufficient. Let it stand so for two natural days ; then pour off the vinegar into a basin, and when it is run off, wash the azure in three or four clear waters, and throw all those waters on to the vinegar which first ran off the azure, as there may perhaps be something useful in it, which you must put with the good. You must then separate the fine azure from the coarse in this manner :—Take a new glazed jar, into which put the azure ; then take ley so warm that you can just bear your hand in it, and some soap scraped very fine with a knife, add to each pound of azure half an ounce of soap, mix all these things together, and then have ready a small bag in which you may shake up the mixture together until it froths ; then empty the pipkin carefully, taking off the scum with a spoon, so that only the coarse part may remain behind ; next take the scum, and put it back into another pipkin with a little more fresh ley, and do the same as you did before ; then pour off into the first basin the coarse parts which remain, and grind it again, and do as before ; afterwards grind that which is with the soap with

in su lo porfido prima che vegna subtili e commo sera tutto macinato bene habbi 4 o 5 catini vitriati poi metti el dito azurro in uno catino nel quale stempera el dicto azurro cum liscia forte remenandolo bene cum mano e quando sera bene stemperato e tu presto presto scola in uno altro vaso e cusci seguita lo lavare per infino ne vieni la liscia chiara e lassa romanere lazurro grosso al fondo e de novo remacina quello grosso che te remasto al fondo commo prima e commo e macinato metilo insieme cum lo primo e lavalò tucto insieme commo da prima e commo tu laverai ben lavato lasselo riposare per uno pater nostro poi scolalo pianamente in uno altro catino poi lo lava tante volte che se ne cava lo sotile e poi de novo macina el grosso se te piace commo di sopra e dicto e tucto lo ricoglie insieme grosso e suctili cio e el primo e el secondo e el terzo e da poi che lai molto bene lavato tanto che nescha la liscia chiara e lassalo bene scolare da la lixia poi lo metti in una pignatta vitriata e e mectivi sopra de lo aceto forte e bianco tanto che lo azurro stia coperto e tanta quantita de sale communo che sia sufficienti e lassa cusci stare per doi di naturali e poi scola el dicto aceto in uno catino e commo e scolato lavalò a tre o a quattro aque chiare e tucte quelle aque bucta in su lo aceto che cavasti prima de lo azurro acio se vi fusse niuna cosa bona la quale mecti insieme cum lo buono da poi sepera lo azurro buono dal grosso in questo modo tolli uno pignatto novo vitriato nel quale mecti el dicto azurro poi tolli liscia ben calda quanto se li possa soffririre la mano e habi del sapone raso ben sottili con lo cortello e vole esser tanto che sia per omne libra de azurro meza oncia de sapone e mistica tutte queste cose insieme poi habbi uno sachetto cum lo quale tu volte e travolte molto bene le dicto cose per infino a tanto che faccia una buona schiuma de poi scola la dicta pignatta in uno catino caute tirando suso la schiuma cum uno cochiaro infini romane solamente lo grosso e da poi tolli la dicta schiuma e de novo lo rimecti in una altra pignatta cum uno altro poco di liscia nova e fa el simili commo da prima poi scola nel primo catino el grosso che te remane remacinalo una altra volta e fa commo prima poi vieni lavando

clear and clean ley, and then take a glazed jar with urine in it, and boil the urine, and for every pound of azure add half an ounce of gum arabic, and scum it well, and put some scent into it. When it has boiled, take it off the fire, and when cool put the azure into it, and let it stand so for a night; then pour off the urine, and let the azure dry in the shade, and turn the azure frequently with a stick; then put it into a little leather bag before it is quite dry, and squeeze it well in your hands, or put it into an ox bladder, which must be prepared by soaking the bladder for one night in vinegar and salt; and keep it well, and you will have an azure like ultramarine.

18. *To make azure by means of the pastille.*—Take pine resin oz. iij, Greek pitch oz. j; pound the pitch and mix the whole with oil, and put it to boil slowly in a glazed jar until it is done, and this may be known in the following manner:—Take a drop of the composition and throw it into cold water, and if it does not stick to your wet fingers it is boiled sufficiently. When it is done, take a glazed basin of cold water, and strain the said composition into the water through a cloth, screwing and squeezing it with a split stick so that it may all come out of the cloth, and let it harden a little in the water; and when you wish to use the pastille, warm it a little, and take for every half pound of the pastille, half a pound of azure—that is, of the stone pounded into a fine powder—and mix and incorporate well the powder and the pastille, and let them lie for a week. Then take a glazed jar, and put into it some tepid water; put the pastille into this water, and wash it very well in the same way that birdlime is washed, pulling and kneading it to and fro in the hand, and taking care not to break it, and continue doing this until the water becomes blue, renewing the water frequently. Then set aside that azure water, and take another basin of water a little warmer than the first; put the pastille into it, and do as you did before until it becomes blue, and put it apart as you did the first, and do this until the water no

quello che e in nel sapone cum liscia ben chiara e netta poi tolli uno pignatto vitriato cum orina e fa bullire la dicta orina ne la quale metti per omni libra dazurro meza oncia de gom-arabico è schiumalo molto bene e metili dentro alcuna cosa odorifera e quando ha bulito levalo dal fuoco e commo e refredato e tu vi metti dentro lo azurro e lassalo cusi stare per una nocte e poi scola via la ditta orina e poi pone asciugare lo dicto azurro a lombra e apre el dicto azurro spesso cum uno bastone poi lo ripone in uno sachecto de corami in nanti che sia in tutto fornito de sciugare e menalo bene per mano o vero tu lo pone in una visicha de bove la quale sia attuata in questo modo farai stare la visicha in lo aceto e sale per una notte e servalo bene e haverai azurro simili al oltrammarino.

18. *A fare azurro per via de pastillo.*—Tolli ragia de pino oz. iij, pece greca oz. j, e pista la pece e mistica omne cosa cum olio et mettilo a bullire a poco a poco e mettilo in una pignatta vitriata infino a tanto che sera cotto e questo se cognosce in questo modo tolli una gocia de la dita compositione e gietala in aqua fredda e se non se apicha ale deta che sieno bagnati e cocta poi quando e cotta tolli uno catino vitriato cum aqua fredda e cola la dita composition in questa aqua cum uno panno spregnendo e ritorcendo cum uno ligno fesso sicche tutto vegna fora del panno e lassalo indurare uno pocho nel aqua poi quando voli operare el dito pastillo rescaldalo uno poco e tolli per omne meza libra de pastillo una libra dazurro cioe la preta pista in polvere sotili e mista insiemli la polve el pastillo molto bene incorporando poi lo lassa stare per 8 di naturali poi tolli uno catino vitriato e metice dentro del aqua tepida e metti lo pastillo in questa aqua e lavallo molto bene commo se lava lo vischio tirando e remenando in qua e in la cum mano e guarda che tu non lo rompi e cusi farai in fino a tanto che laqua diventa azurra renovando spesso laqua alhora pone quella aqua azurra da parte poi tolle uno altro catino cum laqua che sia uno pocho piu calda che laltra prima e metti dentro lo pastillo e fa commo prima intanto che diventa azurra e serbala da parte commo prima e farai cuscì infino a tanto che laqua non

longer comes off blue, and put each water away by itself; cover it up, and let it settle until the azure sinks to the bottom; then take up the water with a sponge cautiously, so as not to move the azure, and when all the water is removed, let the azure at the bottom of the basin dry, and keep it; and know that the first is perfect azure, and is worth five ducats the ounce, the second less, and so the third.

19. *To make azure another way.*—Take lapis lazuli of a violet tinge, very clean from earth and impurities and particularly from pyrites, and break it in a bronze mortar, afterwards grind it very fine upon porphyry or marble, and then dry it. Then make a pastille from the following ingredients, viz.: take for one pound of the stone, 4 oz. of new wax, the same quantity of colophony, 4 oz. of naval pitch, and one ounce of powdered incense, and you must first liquefy the wax in a glazed jar; you must then put 5 ounces of linseed oil, only half of which is to be used at first, the other part is to be reserved. Then add all the other things, pulverizing all that should be in powder, and when they are melted or dissolved, strain them through a linen cloth into a glazed vase, such as a washing basin, filled with clear cold water; then take the pastille with the powder of the lapis lazuli, and put it on a marble slab, and incorporate one with the other. The proof of their being perfectly incorporated is, that the pastille breaks while kneading it in your hands, but it must be done a little at a time, a piece, for instance, of the size of a chestnut, and the whole must be made into a cake, and must be suffered to stand 3 or 4 days. When you wish to extract the azure, do it with hot water, having an assistant to throw the water over your hands while you are kneading and washing the pastille, letting the water run into a glazed vessel, and setting apart three waters, and changing the water until it is no longer coloured. Then let it settle and pour off the water, strain the azure through a cloth, and let it dry, and it will be done.

20. *To make azure another way.*—Take of lapis lazuli one pound, and grind it well and sift it through a linen cloth; after-

diventa piu azurra e metti omne aqua da per se coperta e lassala tanto possare che lo azurro sia andato al fondo poi cava tutta laqua cum una spogna cautamente che lo azurro non se mova poi che sera cavata tucta laqua lassa seccare lo azurro nel fondo del catino e conservalo e sappi che lo primo e perfecto azurro e vale cinque ducate loncia lo secondo vale mancho e cosi lo terzo.

19. *Ad faciendum azurrum per aliam viam.*—Accipe lapis lazuli bene multumque mundum a terra et superfluitate et maxime a marchesita et sit coloratus colore violatii et ipsum tere in mortario bronzi postea macina super porfidum sive marmorem suctiliter postea desicha ipsum deinde fac pastillum existis rebus, viz., sume pro una libra dicti lapidis uncias quatuor cere nove et tantumdem colofonie et untias 4 pice navalis et untiam unam incensi pulverizati et unam ollam habeas vitriatam in qua liquefac ceram super quam pone untias 5 olei seminis lini sed primo non ponas nisi medietatem dicti olei lini et aliam partem serva deinde pona et omnes alias res pulverizatas quæ pulverizanda sunt et quando erunt destrute sive disolute tunc cola per pannum lineum in uno vase vitriato sicut est lavella in quo sit aqua clara et frigida tunc sume pastillum cum pulvere lazuli et pone in marmore et simul bene incorpora unum cum reliquo. Signum vero perfecte incorporationis est quando trando pastillum cum manibus frange tamen debet incorporari ad modicum ad modicum proice qualibet ad quantitatem unius castanee et tunc ex omnibus fiat panis unus et permicte stare diebus tres vel quatuor. Et quando vis extrahere azurrum extrahe ipsum cum callida aqua ita tamen quod unus proiciat aquam super manus tuas et tu move pastillum lavando ipsum et aqua cadat in vase vitriato seperando aquam ter et mutando tantum quod plus non colloretur et permicte posare et sepe aquam et cola azurrum per pannum subtile et permicte sicari et erit factum.

20. *Ad faciendum azurrum per alium modum.*—Summe lapidem lazurinum libram unam et eum tere bene et cribra per

wards grind it fine upon porphyry, and let it dry; then take Greek pitch, naval pitch, olibanum, mastic, vernicem annarii (?), clean new wax 2, 4, 2,¹ and common oil 2, 1; melt all these things together in a saucer and mix them well. Then take a basin full of clear water, and strain into it through a cloth all those things which you melted in the saucer, and anoint your hands with oil, and take the composition which you put into the basin, and knead it well before the fire like wax; then by degrees incorporate the powdered lapis lazuli with it, and let the mass remain in a ball for 3 or 4 days, and the longer the better. Next take a large glazed vase, and put the ball into it, and pour hot water upon it, stirring it with a wooden stick, and working it well until the water is coloured with the azure; separate it, and add fresh hot water, and do as you did before, and put it into another basin. Do this as long as the water comes off coloured, and if there seems to you to be any colour left in the ball, take some common ley almost boiling, and pour it upon the ball and stir it strongly, then put it back with coloured water from the third washing; afterwards, when the water has cleared, pour it off so that none of it may remain, and then cover over those vases with a sieve in the sun, and let them dry. This must only be done in clear weather.

21. *The way to make coarse azure.*—Take the stone called “viterola de lamanea,”² which is like pumice stone, and grind it fine without any liquid. Then take a little turpentine, new wax, and naval pitch, and put it to melt, and when the whole is melted put into it some of the powder of the stone, and stir it with a stick to mix it well; then take warm water and a ladle or a stick, and work it till the azure is extracted, frequently changing the water and setting it aside. Let it dry, and keep it in a leather purse.

¹ These numbers probably refer to pounds, ounces, and drachms; the figure with the comma under it stands for ounces.

² The Viterola de Lamanea is probably native blue Vitriol, or sulphate of copper; because in the Nuovo Plico (p. 126), it is said, that “when Viterolo de Lamanea is boiled with the Verdigris and Sal Ammoniac in strong vinegar, and a piece of iron put into it while boiling hot, when cold

pannum lineum postea tere cum subtiliter in porfido et permicte sicari deinde accipe pecem grecam et piceum navalem, olibanum, masticem et vernicem annarii et ceram novam mundam 2, 4, 2 (*sic*), oleum comune 2, 1, omnia ista fundantur impatella et fortiter incorporentur postea habeas parasidem unam aque clare plenam et cola per pannum omnia que intus infusisti scilicet in patella et tunc acipe de oleo et unge tibi manus et acipe ea que in paraside posuisti et duc bene ad ignem ac si esset cera postea paulatim incorpora dictum pulverem lazurrinum et permittite massa stare admodum palle per 3 vel 4 dies et tanto plus tanto melius erit deinde accipe unum vas cupum et et magnum ut sit vitriatum et intus pone dittam pallam et infunde de aqua calida deinde remove eum cum baculo de ligno et duc fortiter quousque aqua fuerit bene collorata colloris azurri et sepe illam et pone de nova aqua calida et fac sicut prius et mite in alia paraside et sic reitera dummodo aqua venit collorata. Et si tibi videtur quod remanserit de azurro in ditta palla accipe de comuni liscivio quasi bullito et micte desuper palla et duc fortiter et reponere in tertia lavatura cum alia aqua azurra postea quando aqua erit clara proice illa ut nil remaneat et tunc coperies parasides illas cum stamenia ad solem et dimicte sicari et hoc non debes facere nisi per tempus clarum.

21. *Modus faciendi grossum azurrum.*—Summe lapidem qui dicitur viterola de lamanea et est ad instar punicis, tere ipsum sine aliquo licore subtiliter tunc recipe modicum terebentine et cere nove e pice navalis et pone ad liquefaciendum quando erunt liquefacta tunc micte intus pulverem dicti lapidis et move baculo ut sint bene admisia et inde habeas aquam calidam et accipe misculam sive baculum et move tantum quod azurrum exeat mutando semper aquam et secuando ad partem et permicte sicari et serva in bursia corii.

the iron is found to be of the colour of copper ;” being in fact actually coated with copper.

Native Sulphate of Copper occurs massive, stalactitic, and pulverulent ; it is rarely found crystallized. When a portion of it is dissolved in water, and spread on the surface of iron, the latter is immediately covered by a film of copper. See Phil. Min., p. 313.

22. *To make German azure.*—To make azure like German azure, take of rascia¹ as much as you like, that is to say, that rascia which comes from Germany, and which is like stone; crush it upon a marble slab and grind it well, then take gum arabic, and dissolve it in twice the quantity of water, and distemper the gum, and then with this gum water distemper the rascia, and when they are well incorporated, take strong ley made from the ashes of vine branches, and wash the azure two or three times with this ley; then let it settle to the bottom, separate the ley, and let it dry, and the work is done.

23. *To extract sol, i. e. gold, from the lapis lazuli.*—Take lapis lazuli, and pound it very fine on an anvil or in a bronze mortar, or, if you like, grind it on porphyry, first heating it in the fire, and when it is well ground take for every pound of powder an ounce of mercury, and mix it well together with the powder; then take a linen cloth, not of too close a texture, or a sieve, and put these things—that is to say, the powder and the mercury—into whichever of these you choose, and press the piece of linen in order that the quicksilver may pass out with the gold; then pour the quicksilver into a crucible, and put it in the fire, when the mercury will go off in vapour, and the gold will remain behind.

24. *To make azure, and to know the place where it is produced.*—Take lapis lazuli, which is a stone that comes from Organia, in the country of Tartary,² and which is dug from the

¹ I have not been able to find the word "rascia" in any Vocabulary. From the imperfect description of the text, I should consider it to signify the indurated Blue Carbonate of Copper.

² Beckmann says, that the real Lapis Lazuli is found in the mountains of that part of Tartary, called Bucharia, which extends eastward from the Caspian Sea; and particularly at Kalal and Budukschu. This is confirmed by Tavernier in his 'Travels.' I believe it is not found in Hungary, which country we are to understand by the word "Organia," or in Cyprus; but in both these countries are copper mines, which produce the blue ore. From the former, the blue pigment called "Ongaro" by Lomazzo (*Trattato della Pittura*, p. 191), which Pacheco says was used by Titian (*Tratado de la Pintura*, p. 373), was prepared. The blue copper ores of

22. *Ad faciendum azurrum almaneam.*—A fare azurro commo de lamagna tolle la rasscia quella parte che tu vole cio e quella rasscia che vene delamagna la quale e commo petra rompilo in sulo marmo e macinala molto bene poi tolli gomma rabico e doi parte piu che la goma de aqua e stempera la dicta gomma e cum quella aqua gomata stempera la dicta rasscia e quando sonno bene incorporate e tu tolli ranno forte facto de cenere de sciermento e lava lo dicto azurro cum esso ranno doi o tre volte poi lo lassa andare al fondo e sepera lo ranno e lassalo seccare et de facto.

23. *Ad extraendum sol, i. e. aurum, de lapide lazuli.*—Ahvve lo lapis lazuli et tritalo bene subtili in su lancudini o vero in mortaro de bronzo o voi spolverizarlo in porfido metendolo ad infocare nel foco poi commo e bene trito tolli per omne libra dela dicta polve una oncia de mercurio vivo e miscola insiemi cum la dicta polvere ben de vantagio poi tolli panno de lino che non sia troppo ficto o vero una stamegna et in qualunqua tu voli metivi dentro le dicte cose cio e la dicta polvere cum lo ariento vivo e spremi la dicta peza acio nescha lo argento insiemi cum loro poi poni lo dicto ariento in uno crugiolo e pollo al foco lo argento andara via in fumi e el sole remarra in lo fondo.

24. *Ad faciendum azurrum et cognoscendum locum ubi nascitur.*—Tolli lo lapis lazuli lo quale e petra che vene de Organia de paese de tartaria et la se cava la dicta preta de le montagne

Cyprus have always been celebrated, and are still produced there. It is almost unnecessary to observe, that this blue pigment from Hungary and Cyprus is the Azzurro della Magna formerly mentioned. Large quantities of blue copper ore have also been found in Persia; and have frequently been mistaken for Lapis Lazuli. Tavernier gives the following account of it:—

“ In the copper mines of Persia, veins of lazur, which is much used in that country, and with which the flowers on the ceiling and roofs of apartments are painted, have also been found. Before these were discovered the Persians had no other lazur than the real kind, which comes from Tartary, and is exceedingly dear. The Persian lazur is a sort of copper ore; and when the stone is pounded and sifted, which is the process employed with

mountains of that country, and where also are found sapphires and other precious stones. The stone is also dug in the country of Damascus, and in Cyprus; and the people of those parts, who are Tartars and infidels, call it in their tongue "agiara,"¹ that is to say, azure stone. When you want to use this stone, take it, and if the said stone is in large lumps, put them in the fire so as to be heated throughout; suffer them to remain in the fire for ten hours, and let the fire be burning all round them, and if you allow them to stay longer in the fire they will be finer; and if you put them into a pipkin they will be still better refined in the following manner:—Take an unglazed pipkin pierced with many holes at the bottom, and with a few at the sides, and put charcoal around it; then put the large lumps of lapis lazuli into this perforated pipkin, which must be placed on a tripod, and when the stone has been burnt for the above-mentioned space of time, take strong ley made of ashes of oak, or glass ashes—that is soda—and the ley will be so much the better if you take equal quantities of both of these, with a little quicklime, and make a ley as clear and clean as you can, and then put the stone red hot into the cold ley, and let it remain for three days; next pour off the ley, and let the stone dry, and then pound it in a metal mortar, and reduce it to as fine a powder as you can; and if the stone should contain any gold, you will extract it with quicksilver as was before directed. When it is well sifted, so as to be very fine, put it into a shell of cold water, and mix it with a clean spoon, and then let it settle in that water till the powder is all gone to the bottom, and all the impurities remain above; then separate the water from the dust with a sponge, softly, so as not to disturb the powder or the

the real kind, it forms a fine paint, which appears very bright and pleasant. After this discovery, the Persians durst no more purchase the Tartarian lazur; and Mahomet Beg issued an order that painters should not use foreign but Persian lazur. This prohibition, however, did not long continue; for the Persian lazur could not stand the effects of the atmosphere like the real kind, but in the course of time became of a dark and dismal colour. Sometimes it was full of scales, and would not hang to the end of a soft

che sonno in quelli paesi e la se trovano zaffirri et altre prete pretiose. Et ancora se cava de la dicta preta in le parte damasco et in le parte de cipre et la gente de quelli parte che sonno tartari et infideli la chiamano in loro lingua agiara cioe petra de azurro. Et quando voi lavorare la dicta preta prendila e se la dicta preta fusse in zuppi grossi metti i peze nel fuoco che arda da omne parte e lassali stare nel foco per x hore e fa che habia bene il foco da omne parte e se piu la lassi stare nel foco piu se affinara. E se tu la mette in una pignatta ancora se affina meglio in questo modo: tolli una pignatta non vitriata e metti de intorno carboni e la pignatta vole esser forata nel fondo cum spessi bugi e cum alcuni bugi de intorno poi poni in la dicta pignatta bugiata li pezi de lo dicto lapis grossi e la dicta pignatta vole esser sospesa in uno tre pei poi che sera la dicta preta bene cocta et bene infocata per lo dicto spatio habi liscia forte facta de cenere de cerro o de cenere de vetrio cioe soda tanto migliore serà la liscia se tu vi poni de luna e del altra cenere anna et cum uno pochettino de calcina viva et fa liscia chiara et necta quanto piu poi poi cusci calda metti la petra in lo dicto ranno freddo e lassa stare per 3 di poi sepera la dicta liscia e lassa rescugare la dicta preta poi la pista in uno mortaro de metallo e fa polvere piu subtile che poi et se la dicta petra tenesse doro farai cum lo argento vivo commo e di sopra dicto et commo e ben staciata che sia ben subtili mettila in una concha daqua fredda e mista bene cum una mescola necta bene e poi la lassa ben reposare in quella aqua che la polvere sia bene andata al fondo et omne cativita rimara de sopra et sepera laqua de la polve cum una spogna pianamente che non movi la dicta polvere o dicto azurro e se vedesci che

hair brush. On this account it was soon neglected as a coloured earth, and the lazur of Tartary again introduced."

¹ Agiara. The usual term for Azurro in those parts of Italy situated between the Apennines and the Po. It occurs in contracts for pictures by Denys Calvart, and Marc Antonio Seccadenari in 1601, and by Ludovico Carracci in 1587.

azure ; and if you see that it is not well cleansed, wash it another time in the before-mentioned manner ; and when it is quite clean let it dry, and grind it dry on the porphyry as fine as you can, a little at a time ; and if you should have any trouble in grinding it dry, add a little water to it, and when you have ground it fine put it into a large and flat glazed earthenware pan, spread it along, and let it dry, and then grind it again on the porphyry, and sift it very fine. It must then be refined with the pastille, made according to this recipe :—Take 1 oz. of white resin, 1 oz. of incense, 8 oz. of Greek pitch, 1½ oz. of turpentine, 1 oz. of linseed oil, and if you wish to make a greater quantity make it according to this proportion ; then take a glazed pipkin, and put it on the fire on a tripod, and make a fire of charcoal without flame ; first put the oil into the saucepan, and let it get warm, and then the Greek pitch, mix them together with a clean spoon, and when the pitch is well melted add the resin, and keep continually stirring it ; then add the incense, and then the turpentine, and mix all together, and take care to keep a moderate fire, in order that the mixture may not catch fire inside ; then remove the vessel from the fire, and strain the contents through canvass like a strainer. Next take a basin of glazed earthenware, and fill it half full of clear cold water, and put that canvass over the basin, and then strain the mixture which is in the pipkin into this water, and when you have strained it all, take it out of the water, and put it where it will not get dirty. If you wish to refine one pound of lapis lazuli, take two pounds of this pastille, and it will even bear another ounce of azure. Then take a clean glazed saucepan, and put it over a moderate fire, and add another ounce of Greek pitch, and it will be sufficient for making a larger quantity ; put the oil into it, and do as before, and let it melt slowly ; then remove the saucepan from the fire, and pour it while hot over the lapis lazuli, and mix it well. When it is well incorporated, before it gets cold, take a shell of fresh water and pour it on the hot pastille which you have in the pipkin, and the whole will sink to the bottom and adhere together ; and when

non fusse bene depurgato lavalò una altra volta alo dicto modo e commo sara bene depurgato lassa lo sciugare poi lo macina in su lo porfido cuscio dasciuto quanto piu poi a poco per volta et se te fosse fatiga a macinare dasciuto metice uno poco daqua poi che lai macinato subtili metilo in uno vaso de terra vitriato largo e piano e stendivilo suso et lassalo sciugare bene poi lo aremacina in lo dicto porfido e statiarlo che sia ben subtili poi se vole darli la concia cum lo pastillo cioe cum questa maestra. Tolli oz. j de ragia bianca, oz. j. de incenso, oz. 8 de pece greca, oz. 1½ de trementina, oz. j de olio de seme de lino se ne voi far maggior quantita fallo secondo questa proportione poi habbi uno tegami vitriato e pollo al foco in su li tre pej et fa fuoco de bragia e non de fiamma prima metti in lo dicto tegami lolio et lassalo uno poco scaldare et poi la pece greca e mescola insieme cum una mescola necta et quando la pece e ben disfatta mettivi la rasina et vene sempre mescolando poi lo incenso poi la trementina et mista et fa che lo foco sia molto temperato accio non se acenda dentro poi levalo dal foco e colalo cum uno canavaccio ad modo duno colatoro poi tolli uno catino de terra vitriato et fallo mezo daqua chiara et fredda et metti quello canavaccio sopra alo catino poi cola et metivi suso quella decoctione che e in lo dicto tegami et fa bene colare dentro in questa aqua poi che lai colata tucta cavala de laqua et ponila in loco che non se imbrutta. E se voi afinare una libra de azurro tolli doi libre de questo pastillo et anco comportara una oncia de azurro piu poi tolli uno tegami necto vitriato e ponilo al foco temperato et mettivi oz. j. piu de pece greca et basteralti per farne maggiore quantita et metivi dentro lolio et fa comuno de sopra et lassalo strengiare adagio poi leva lo tegami dal foco et cosi caldo mettivi su la polvere de lo lapis lazuli e mista bene et quando sara bene incorporata prima che se freddi habbi una concha daqua fresca e metivi in su questa materia cosci calda che hai nel tegami et tucta la materia andara al fondo et arapicasse insieme et commo e bene arapicato cavala de laqua et rimenala per mano commo pasta tirando et distendendola bene poi lo pone nel aqua del catino et se apicha ale

it coheres firmly, take it out of the water and knead it in your hands like dough, pulling and spreading it well. Then put it into the water in the basin, and if it sticks to your fingers anoint them with linseed oil; let the pastille remain in the said water for six days, changing the water in summer twice each day, and in winter once; and when you wish to extract the azure, take a glazed basin and put the pastille into it, with tepid water; let the pastille get warm, and cover it with a ladle and press it. When it is well melted, put a little hotter water to it, or else warm that same water in a vase, and so wash it eight times with that same water, and then let it cool, and the pastille will float upon the top, and the azure will go to the bottom; and you must keep the water covered, in order that no dirt may get into it. Then remove the water with the pastille softly, in order that the azure which is at the bottom may not be disturbed; warm the water that was removed, and return it upon the azure, and then let it cool, and the pastille will float upon the top. Then separate the water and make it boil, and when boiled return it upon the azure as before, and take out the pastille, which will be good for making other azures, and put it away in a clean place; and know that the first azure is the finest, the second less fine, and the third still less; and you must keep the azure in a chamois leather purse, or in a glazed earthenware jar.

25. *The way to refine the pastille; and if it should happen to get burnt so that the azure does not work out, the way to cure it.*— Put cold water into a pipkin and place it over the fire. When the water is hot, put the burnt pastille into it, and when the pastille also begins to get hot, take it out of the water, and put it into a glazed jar, and again place it over a slow fire; then add to the pastille the following things. If the azure and the pastille together weigh two pounds, add 1 oz. of new wax, 1 oz. of olive-oil, 1 oz. of turpentine, and mix all well together with the pastille, and take the pipkin from the fire and pour cold water into it and let it cool; then knead and work it as before, and if it should stick to your hands, anoint them with

mano ongite le mano cum lolio de semi di lino et lassa stare in la dicta aqua per 6 di mutando laqua destate doi volte el di et de inverno una volta et quando voi cavare el dicto azurro tolli una catino vitrio et metivi dentro el dicto pastillo et habi aqua tepida e lassa rescaldare el dicto pastillo et coprilo cum una miscola et vienlo spremendo et quando lo pastillo e bene disfacto metivi uno poco daqua piu calda o vero rescaldala quella aqua medesima in qualche vaso et cosi cum quella medesima aqua calda lo lava 8 volte poi lassa refredare et el pastillo rimara de sopra et lazurro andara al fondo et tene coperta la dicta aqua acio non vi vada alcuna bruttura poi cava laqua de sopra insiemi cum lo pastillo pianamente che lazuro che e in nel fondo non se mova poi pone quella aqua a scaldare et ritornala sopra a lo azurro et lassa poi reposare et el pastillo arivra a sommo poi sepera la dicta aqua et falla bullire et ritornala bulita sopra a lo azurro al dicto modo et cava fora el pastillo che e buono per chavare deli altre azure e riponilo in loco netto et sappi che el primo azurro e piu fino lo secondo meno lo terzo mancho et serbali in saculo camusci o vero in albio de terra vitriato.

25. *Modo affinare el pastillo se caso fusse che te venisse arso che non ne uscisse lazurro pratica a raconciarlo.*—Tolli uno pagnolo et metivi dentro aqua fredda et ponilo al foco et quando e calda metivi dentro lo pastillo arso et commo se cominza a rescaldarse cavalo fora et habbi uno tegami vitriato et pollo al foco et metivi dentro el pastillo et dalli il foco lento et giongivi sopra del pastillo queste cose se fusse infra lo azurro et lo pastillo libre doi oz. j de cera nova, oz. j de olio de olivo, oz. j de trementina et miscola omne cosa bene insiemi cum lo pastillo et leva el tegami dal foco et metivi dentro aqua fredda et lassa lo refredare poi lor mena et extiralo commo prima et se se apicasse ale mano ongiti le mano cum olio et per questo

oil, and in this way you will make it right, and you may wash the azure out of it as before, and it will be good azure.

26. *The way to make the pastille to prepare one of these stones when it is much finer than the rest.*—Take 4 oz. of white resin, 8 oz. of Greek pitch, 1 oz. of turpentine, 1 oz. of mastic, 1 oz. of linseed-oil, and use this for a pound of the lapis lazuli, and do as you did before.

modo lo riconciarai et cavane poi lo azurro commo de sopra et sera fino azurro.

26. *Modo da fare el pastillo per lavorare una di queste prete quando fusse piu fina de vantagio piu che laltre.*—Pilglia oz. 4 de ragia bianca et oz. 8 de pece greca, oz. j de trementina, oz j de mastice, oz. j de olio de semi de lino et questo adopera per una libra de la dicta preta dazurro et fa la pratica commo di sopra.

HERE BEGINS THE SECOND TREATISE

CONCERNING MANY AZURES THAT ARE MADE ARTIFICIALLY:
AND FIRST WE MUST TREAT OF THE TRIAL OF AZURES,
WHETHER THEY ARE NATURAL MINERAL AZURES, OR
WHETHER THEY ARE ARTIFICIALLY MADE.

27. *How to know ultramarine azure from the artificial, by trial and examination.*¹—Take the dust of the mineral, or a little of the azure extracted from the mineral, and put it on a red-hot plate of iron shining and without rust. If it does not change colour, it is excellent. If it turns black, it is of little value. If it is adulterated, the ash will be pale. If it turns whitish, it is made artificially.

28. *It is known in another way by experience.*²—Put a little azure in your hand, or into a shovel, pour clean water upon it, and rub it with your fingers, and if it immediately settles into the cracks of your hands or of the shovel, that azure is very fine and good; otherwise it is not so.

29. *To make azure artificially.*—Take one pound of brass filings, and the same quantity of sal ammoniac³ or a little less, and dissolve the sal ammoniac in aqua tartari; then, with that water, make a paste with verdigris, and put it into a glass cucurbit covered and sealed up like a blind alembic,⁴ and let it stand under hot dung for 15 days; then take out what is inside and put it into a crucible in a place where it will melt, but uncovered; when melted take it out, and when it is cool, grind it on a stone with aqua tartari, and let it dry, and you

¹ This recipe is also in the Paris MS. vi. MDCCXLIX. No. 9. If the mineral turn black, this is a proof that it is copper ore, and not Lapis Lazuli. Eraclius mentions the same test for distinguishing the true Lapis Lazuli.

² This recipe is also in the Paris MS.

INCIPIIT SECUNDUS TRACTATUS

DE MULTIS AZURRIS PER ARTIFICIUM FIENDIS ET ARTIFICIALITER FACTIS: ET PRIMO DICENDUM ET VIDENDUM EST DE PROBATIONE AZURRORUM SI SUNT NATURALIA DE MINERA AN ARTIFICIALITER FACTA.

27. *Modus cognoscendi azurrum ultramarinum ab artificiale per experientiam et examen.*—Accipe pulverem minere ejus aut parum de azurro extracto de minera et eum pone super laminam ferri ignitam et nitidam absque erugine. Si non mutaverit collorem optimum est. Si vero revertit ad nigredinem parum valet. Si vero affalsatum est cinis smortua efficietur. Si vero revertitur ad albedinem artificialiter factum est.

28. *Alio modo cognoscitur per experientiam.*—Pone aliquantulum de azurro in manu tua aut pone in scutella et desuper infunde aquam claram et frica cum digitis postea subito si aderat per manus rimmulas aut per scutellam azurrum illud valde pulcrum et bonum est aliter non.

29. *Ad faciendum azurrum per artificium.*—Abbeas libram unam limature heris et tantundem salis armoniaci vel parum minus et solutum sit sal in aqua tartari sive oleo deinde cum aqua ista fac lutum de viride heris et micta in cucurbita vitri coperta et sigillata ad modum factum elembicum cecum et dimitte sub fimo calido quindecim diebus—postea extrahe quod est intus et micta in crugibulo et micta in loco fusionis scoperto tamen ut fundatur deinde extrahe et cum refigdatum fuerit ducas super lapidem cum oleo sive aqua tartari et per-

³ Sal Ammoniac is now called Hydrochlorate of Ammonia, and "aqua tartari sive oleo" is a solution of Potash.

⁴ A blind Alembic appears to be an alembic without a pipe for conveying the vapour to a receiver.

will have azure ; and if you wish to make it brilliant, colour it with a solution of scraped verzino in white wine, in the same manner as you were directed in the other recipe concerning natural azure.

30. *To make azure artificially.*—Take four parts of a stone brought from beyond sea, which is called mercury, and it must be sublimed according to the usual method, that is to say, it must be held on a red hot and burning plate, for a considerable space of time, in order that it may be reduced to powder, then take two parts of sal ammoniac, and one part of sulphur, grind each well by itself; then mix them well, and put them into a glass vase, lute the vase with the philosopher's lute,¹ and let it dry. Then put the vessel into the furnace, and give it a moderate fire, and when you see the white smoke come out of the mouth of the vase, make no more fire; and when it is cold break the vase cautiously and you will find good azure.

31. *To make artificial azure.*—Take fine marble, and about an equal quantity, by guess, of the flower of metal² which the dyers use, and grind them well together, boil them in good red wine, put the mixture in the sun to dry; afterwards grind it again, adding more of the said flower, then grind it and dry it again. Afterwards take verdigris and indico, and grind them well together, and then you must have "lac calvisei," otherwise called starch, and mix the ingredients until the colour pleases you. Put it in the sun to dry and it is done.

32. *To make azure.*—Take of Roman vitriol 1 lb., saltpetre $\frac{1}{2}$ lb., of cinnabar 2 oz., of roche alum 3 oz., of sal ammoniac 1 oz., of orpiment 1 oz., of verdigris 1 oz.; and let each be ground separately very fine, and then let them be mixed together, and afterwards put them to distil in an alembic; first with a very slow fire,

¹ Lutum Sapientæ consisted of white of egg beaten to a froth, and mixed with iron filings. A coat of this was to be applied on the vessel to be luted, and when this was dry, another coat was to be given; and so on until three or four had been applied. (See Breve Compendio di Maravigliosi Segreti dal Sig. F. Domenica Auda Venezia e Bassano. And see I Secreti di Don Alessio Piemontese, Part I., p. 137. Ed. Venezia, 1557.)

maicte siccari et habebis azurrum et si vis illuminare ipsum mitte verzinum abrasum in vino albo et collora ut habuisti in alia recepta de azurro naturale.

30. *Ad faciendum azurrum per artificium.*—Tolli parte quattro duna preta ultramarina che se chiama mercurio e volse solimare secondo el loro modo cioe che se vole tenere in su la piastra infocata e acesa per spatio duno pezo acio che se possa spolverizare poi tolli doi parte de sale armoniacho et una parte de solfano e macina bene omue una da per se e poi le mistica bene et mectile in uno vaso de vetro et lutalo cum luto de sapientia o vero philosophico et lassa seccare poi lo mecti in lo fornello et dalli el fuoco moderato et quando tu vederai uscire el fumo bianco per la bocca del vaso non fare piu foco et quando e freddo rompe lo vaso cautamente et trovarai buono azurro.

31. *Ad faciendum azurrum artificiale.*—Summe de lapide pulcro marmoreo et tantundem ad extimationem de flore mectalli quo tintores utuntur et tere simul bene et fac deinde bullire in vino rubeo bono et pone ad solem ut siccetur postea iterum tere adendo de dicto flore et sicca deinde iterum tere et sicca postea accipe de viride ere et de indica, et bene simul tere deinde habeas lac calvisej aliter vocatur amido et simul misce donec color tibi placet et pone ad solem ut siccetur et erit factum.

32. *Ad azurrum faciendum.*—Recipe vitrioli romani libram unam, salis nitrii libram mediam cinabrii oz. 2, aluminis rocze oz. 3, salis armoniaci oz. j, auripiumenti oz. j, viridis æris oz. unam et quodlibet per se teratur subtiliter deinde insimul corporentur et postea pone ad distillandum per elembicum primo

* I think this is a mistake, and that for "mectalli" we should read "guati," as in Nos. 36, 40, 75, 76, and 77. The explanation of the term is given in No. 75, where it is said to be the froth which floats on the dyers' vats when they are dyeing with woad. This froth is the produce of fermentation.

and take off the first water by itself, until the alembic reddens, then put away that water by itself, and collect the next water, that is the second water.¹ You must know, as I said before, that the fire must be gentle at first, for the first 6 hours; and you must then increase the fire until the alembic gets white hot, and no longer emits a red smoke, which shows itself in the recipient vase; then let it cool, and this water will be stronger than any water in the world. For this water dissolves and corrodes, and reduces to water all things under the sky, namely, stones and metals, and is white and clear like spring water; and, if heated, gives out a very red smoke; it is strong and acrid, and must therefore be kept securely closed. And when you wish to make azure, take that second water, which you set apart, and dissolve verdigris in it, keep it in a glass vase, and warm it a little at the fire, as the jewellers do, because it will dissolve sooner, and when it is dissolved, put some oxide of tin into it and evaporate the water, and in the bottom of the vase you will find very beautiful azure. And if you wish it to be more beautiful and like ultramarine azure in appearance, take very fine brass filings, and put them into the before-mentioned water, and do as above directed; when they are dissolved, put oxide of tin into the mixture, and do as before, and you will have an azure better than German azure, and in appearance and colour it will be equal to ultramarine. If in that water you dissolve the golden marcasite, as before, you will find a beautiful purple, and if you dissolve iron filings in it, and put calcined brass into that water, you will have a red colour, which is called "minius."

33. *To make azure.*—Take of lime made from marble or travertine, obtained from the living rock, one pound, of verdigris one pound, of sal ammoniac two pounds, and grind the whole together to a fine powder; make the whole into a paste with spirit of wine like rather stiff dough, and then put the com-

¹ The water described here is evidently nitro-muriatic acid, the aqua regia of the Alchemists. This recipe is a proof that the colour called the "Purple of Cassius," was known at least 150 years before the period of its

cum igne lentissimo et accipe aquam primam per se donec erubescat alembicus tunc remove aquam illam per se et collige aquam per se aliam scilicet secundam aquam et scias ut supra dixi ignis primus esse debet lentus per 6 horas deinde auge fortem ignem donec alembicus albescat et non amplius mictet fumum rubeum qui in vase apparebit tunc dimitte frigidari et supra dicta aqua est fortior quam aquam mundi. Nam hæc aqua solvit et corrodit et in aquam rediget omnia quæ sub celi sunt viz. lapides et metalla et est alba et clara sicut aqua fontis et si calefit emitet fumum rubicundissimum durum et fortem et ideo serva eam bene obturata. Et cum vis azurrum facere, acipe secundam aquam quam servasti et in ea dissolve viridem eris et tene eam in vase vitri et aliquantulum calefac ad ignem in modum orifici quia citius dissolveretur et dissolutum desuper pone de calce Jovis et evapora aquam et infundo vasis invenies azurrum valde pulcrum et si vis eum pulcriorem quasi azurrum ultramarinum in aparentia. Accipe limaturam eris vel octoni subtilissimam et pone in prædicta aqua et fac ut supra ut dissolvatur et dissolutum desuper pone calcem Jovis et fac ut supra et habebis azurrum meliorem quam almaneam et in aparentia et in colore est sicut azurrum ultramarinum. Et si in ista aqua dissolveris marchesitam auream ut supra pulcrum pavonatum invenies. Et si dissolveris in ea ferrum limatum et in tali aqua posueris es ustum invenies colorem rubicundum qui vocatur minius.

33. *Ad faciendum azurrum.*—Accipe calcina marmorina o vero travertina in petra viva libri unum verderamo libre j sale armoniaco libre 2 et macina omne cosa subtili et in pasta cum aqua vite in modo duna pasta de pane durecto poi pone la dicta compositione in uno panno de lino grosso et forte et poninolo

reputed discovery. The golden marcasite (auriferous iron pyrites) being dissolved in the aqua regia, was precipitated by the oxide of tin, and the result was a beautiful purple colour.

position into a thick and strong linen cloth, and place it in dung for the space of a month. Then take it out, when it will have become hard like a stone ; and if it does not become hard, let it remain beneath the hot dung until it hardens, and then pound it fine and grind it on marble, and take for every pound of this composition two ounces of the flower of woad, and grind them together, and rub them up with a little spirit of wine, and incorporate all well together ; then let the composition dry, and keep it in a bag of chamois-leather excluded from the air.

34. *To make azure.*—Take of sal ammoniac two pounds, and brass filings two pounds, and sublime the mixture 6 or 7 times. Put the azure which is at the bottom upon a marble slab in a damp place, and it will dissolve into a blue water, and do the same with the sal ammoniac, mixing it with the azure, which it will soon soak up, and put it to dry. And know that this can be done with every metal, but brass and copper are the best, and the least expensive ; and this azure is worth 4 ducats the pound.

35. *To make azure.*—Take 1 oz. of sal-ammoniac, and 6 oz. of verdigris, and grind these powders very fine with oil of tartar upon marble ; then put them into a glazed vase, and let them stand some days, and you will find the verdigris converted into a very beautiful azure.

36. *The way to make azure.*—Take the shells of hens' eggs well washed, and put them into a new jar, and lute the jar with lutum sapientiaë. Calcine the shells and then grind them fine upon a stone ; afterwards take clean indigo¹ liquefied with common water, and mix the lime with that colour by grinding it upon the stone, a little at a time, until it assumes a good colour. But if you have no indigo, use the froth of dyer's woad instead of it, and do as before ; and know that while the woad is boiling in the dyer's cauldron, you must take away the froth and mix it with the egg-shells, and afterwards dry and keep it.

37. *To make azure.*—Take of refined saltpetre, brass filings, sal-ammoniac, sulphur vivum, and quicklime, each one ounce,

¹ This is the true Indigo.

socto lo litami per spatio duno mese de po el tra fora essendo tornato duro in forma de petra et non tornando duro lassalo tanto stare sotto lo litami caldo che diventi duro et de poi lo pista subtili et macinalo in marmo subtili poi tolli per omne libra de la dicta compositione oz. 2 de fiore de guato et macina de compagnia et sborfandoli cum uno poco daqua vite et incorpora bene insiemj poi lassa sciutare et serbalo in saculo de camoscio che non stia alayere.

34. *Affare azurro.*—Tolli sale armoniaco lb. 2 limatura de octone lb. 2, e fa solimare sei o 7 volte et pone lo azurro che e in fondo sopra uno marmo steso in loco humidø e dissolvesse in aqua cilistrina et el simili fa del sale armoniaco et aggiungi insieme et imbevera lo azurro de sopra ditto sopra el marmo et imbeverasse presto e pollo a secare et sappi che se po fare de omne metallo ma loctone et lo ramo e piu digno et cum mancho spesa et el dicto azurro vale ducate 4 la libbra.

35. *Ad faciendum azurrun.*—Accipe sale armoniaco oz. j verderame oz. 6 et macina queste polve bene subtili cum olio de tartaro sopra marmo poi lo pone in uno vaso vitriato et lassalo stare alcuni di et troverai lo verderamo convertito tucto in azurro asa bello.

36. *Modus faciendi azurrun.*—Recipe testas ovorum gallinarum ben lotis et mitte in olla nova et luta luto sapientie et calcina et deinde tere subtili super lapidem tunc accipe indicum bene mundum et liquefactum cum aqua comuni et cum isto colore misce super lapidem terendo dictam calcem paulatim paulatim quoutque habeat collorem bonum. Si autem non habes dictum collorem indici loco ipsius pone spumam guati tintorum. Eodem modo fac ut supra et scias quando guatum bulit in caldarea tintorum debes spumam auferre et miscere cum dictis testis ovorum et postea sicca et serba.

37. *Ad azurrun faciendum.*—Summe salnitrij affinati limature octonis salis armoniaci sulphuris vivi calcis vive an. oz. j

grind what is necessary to be ground, and put the ingredients into a glass jar, and pour very strong white vinegar upon them, so as to cover the powders. Lute the jar with lutum sapientiæ, and put it in dung for 15 days; then grind the powder, and preserve it in a purse of chamois-leather.

38. *To make azure in another way.*—Take one drachm of indigo, and grind it well, and take a great quantity of the juice of the euphorbia,¹ and mix and incorporate them well. Put them in the sun, let them dry, and preserve them.

39. *To make azure.*—Procure some very white marble or travertine, and bake it in a furnace in a linen cloth, lute it with lutum sapientiæ; then take the lime, and put it into water, and wash it three or four times. Afterwards take indigo, wash it in water, and let the lime absorb that water; then dry it in the shade. Repeat the operation until the colour suits you.

40. *To make azure.*—Take very white marble, and roast it in the fire for a day and a night, and when it is calcined grind it fine upon another marble slab; then take the froth of indigo or woad which is in the dyer's vat, and soak the powder in it, and do this until the colour of the azure pleases you, then dry it; and when you require it, take and use it.

41. *To make artificial azure.*—Take of sal-ammoniac 1 part, of verdigris 2 parts, of ceruse $\frac{1}{2}$ a part, grind them well together, and make them into a paste with oil of tartar, and put the whole into a glass vase luted in the manner of the philosophers; and when the lute is dry put it into the oven while the bread is baking, and when the bread shall have been baked 7 times, the process will be completed.

42. *To make good azure.*—Take the third part of a pound of lime made from marble or travertine, 4 oz. of verdigris, and two oz. of sal-ammoniac, grind the whole together with strong white vinegar, in the manner of a sauce, and then put it into a jar well closed, and expose it to the air for three days and

¹ Lac Turtumagli—the juice of a species of Euphorbia. Matthioli (p. 1318) names seven species; but it is probable that the species from

pro quolibet teranturque que terenda sunt et pone in olla vitriata et super-pone acetum album fortissimum ut supernactet pulveribus et luta ollam luto sapientiæ et pone sub fimo diebus 15^{im} deinde macina ipsum et repone in bursia camuscij.

38. *Ad faciendum azurrum per alium modum.*—Tolle unam dragmam indici et bene molle et habeas multum lac turtumagli et simul misce et bene incorpora et pone ad solem et dimitte siccari et repone.

39. *Ad azurrum faciendum.*—Invenies marmorem sive travertinum colloris albissimi et quoquatur in furno in panni lini lutato luto sapientiæ deinde accipiatur cals et ponatur in aqua et lavetur ter vel quatuor postea accipe indicum et lavetur in aqua et cals illius aque potetur deinde siccetur in umbram et iteretur operatio donec color tibi placeat.

40. *Ad azurrum faciendum.*—Recipe marmorem albissimum et alla ipsum in igne per diemque noctem et cum calcinatum fuerit super alium marmorem subtile tere deinde Recipe spumam indici sive guati quam in caldaria tintorum est et imbibe per dictum pulverem fortiter et cum siccum fuerit iterum imbibe et hoc tamdiu facies donec collar azurri tibi placeat et sica et cum opus fuerit tolle et utere ipso.

41. *Affare azurro artificiale.*—Accipe sale armoniaco parte j. verderame parte 2 biacha parte meza spolverizati bene insiemj et impasta cum olio de tartaro et pone omne cosa in uno vaso de vetrio alutato al modo filosofico poi che e secco lo loto ponilo in lo forno del pane quando el pane se coce poi the sera cocto el pane 7. volte sera facto.

42. *Affare azurro bono.*—Summe lo terzo duna lb. de calcina marmorina o travertina et oz. 4 de verderamo et oz. doi de sale armoniaco poi macina omne cosa insiemj cum aceto forte e biancho ad modo duno sapore poi lo mecti in una ampolla bene turata et mectila alayera per tre di et tre nocti poi la soc-

whence this milky juice was extracted was the Euphorbia Esula, the Tithymalus Pinea, called in Italian Erba latte and Lataroli.

nights; then bury it, and let it have rain, wind, sun and air, and suffer it to remain for the space of six months, and let it be exposed both to the winter and summer. At the end of 6 months or thereabouts take it out, and break it, and you will find the azure, at which you will rejoice; grind it well with strong ley, put it into a glazed vase, and let it rest until it sinks to the bottom; then pour off the ley and wash it again with very weak and clear ley, and do as before. Then wash it with clear cold water, and let it settle, the good azure will sink to the bottom, and the bad will remain in the water like indigo. Then remove that blue water with a sponge so as not to disturb the azure that is at the bottom, and let it dry in the shade, and you will have good and fine azure. Keep it in leather so that the air may not have access to it.

43. *To make azure.*—Take of verdigris 6 oz., sal-ammoniac 1 oz., unburnt gesso 1 oz., grind each dry by itself, then mix them together and soak the powders with water of tartar, so that the water may cover the powders, and put all into a flask, and stop well the mouth of the flask. Tie a string round its neck, and hang it to the chain in the smoke for some days, and you will find the azure, which you must grind well, and then preserve it.

44. *To make splendid azure.*—To make splendid azure for walls. Take a glass [copper?] flask, and put into it enough powdered travertine, well and finely ground, to fill it half way, and pour upon it very strong vinegar distilled through an alembic, so as to fill the flask. Then seal up the mouth of the flask, and put it in dung or in the refuse of grapes for a month. Afterwards take it out, and you will have azure, which you may grind and keep.

45. *To make azure.*—Take very thin plates of silver, and fasten them skilfully over the vapour of very strong vinegar in a jar, so that there may be a space of one finger's breadth between the vinegar and the plates; cover the jar well to exclude the air, and put it in a warm place, such as dung or the refuse of grapes, for a month, then uncover it, and you will see the azure upon the silver plates. This you must rub and scrape

terra et fache habia aqua et vento et sole et ayere et lassala stare per spatio de 6 mesi et fache ella participa delo inverno et dela state in capo de 6 mesi o circha cavarala fora et rompila et troverai lo azurro del quale tene alegrarai et macinalo sotili in marmo cum liscia forte et pollo in uno vaso vitriato et lassa posare tanto che vada al fondo poi sepera la liscia et lavalo una altra volta cum liscia dolce dolce et chiara et fa commo prima poi lo lava cum aqua chiara et fredda poi lo lassa posare et lo azurro bono andara al fondo et el grosso stara per laqua ad modo duno endico et cava fora quella aqua cilistrina cum una sponga per modo che non conturbi lo azurro che e al fondo et lassa secare alombra et haverai azurro bello et bono et serbalo in corami che non senta ayere.

43. *Ad azurrum faciendum.*—Recipe verderame oz. 6. sale armoniaco oz. j guersa cruda oz. j et macina cescunj subtili dasciuto poi le mista insieme et imbevera le dicte polvere cum aqua de tartaro che laqua sopravanza ale dicte polvere et metti omne cosa in una ampolla et obtura bene la bocca de lampolla et legala in lo collo et appiccala al fumo sopra ala catena per alcuni di et troverai lo azurro el quale macinalo bene et serbalo.

44. *Ad faciendum azurrum feriale.*—Ut habeas azurrum feriale per murum. Recipe ampulla vitrii et intus pone tantum de pulvere travertini bene tritirati et subtili ut dimidiam sit et desuper pone acetum fortissimum distillatum per alembicum ut vas sit plenum et os ejus optime sigillatum et pone sub fimo aut venacia per unum mensem postea extrahe et habebis azurrum quod tere et serba.

45. *A (sic) faciendum azurrum.*—Summe laminas argenteas subtilissimas et liga ingeniose supra vaporem aceti fortissimi in olla ita quod remaneat unius digitis de vacuitate inter acetum et laminas et coperi bene ollam ut non respiret et pone eam in loco callido ut est fimus aut venatia per unam mensem et descoperias et videbis azurrum super laminas quem frica et rade et repone dictas laminas ut supra et sic reitera donec consumentur

off, and then put back the plates as before, and repeat this until they are consumed. And if you have no silver plates put brass plates instead, and do as before; but it will not be so beautiful.

46. *To make azure.*—Take one part of sulphur vivum, two parts of Roman vitriol,¹ both in fine powder, and two parts of quicksilver. Put these articles well mixed into a flask, and heat them as you did the vermilion; when it is done it will give out a blue smoke. Then take it from the fire, and when it is cool grind and keep it.

47. *To make azure.*²—Take 2 ounces of quicksilver, 3 ounces of sulphur, and 4 ounces of sal-ammoniac; grind the sulphur and sal-ammoniac very fine, and then take a flask with a long neck, and lute it with lutum sapientiae on the outside the thickness of one finger from the neck downwards, and let it dry. Then put the before-mentioned ingredients into the flask, and stop up the mouth of the flask with a cork, make a very small hole in the middle of it, and put this flask into a new unglazed jar nearly full of sifted ashes, so that it may be covered half way up the neck by the ashes. Then put the jar over a charcoal fire, let the fire be very slow for the first four hours, and increase the heat until you see white or blue smoke issue out of the flask. Then immediately remove the fire, let the flask cool and then break it; grind the azure fine on porphyry, and keep it in a place free from air, and you will have good azure.

48. *To make azure.*—Take of roche alum, Roman vitriol, and saltpetre, each one ounce; distil them through an alembic, and then keep the water in a vessel securely closed. Then take calcined egg-shells, and grind them with the distilled water, and let them dry: do this three or four times. Then take very strong vinegar, and for every pound of vinegar take 5 oz. of verdigris; grind it up with the vinegar, and distil it through an alembic, and with that distilled vinegar soak and grind the egg-shells three or four times. Then dry the mass, and keep

¹ I think that in this case, Roman Vitriol signifies Sulphate of Copper.

et si non habes laminas argenti loco ipsius pone laminas octoni et fiet ut supra sed non ita pulcrum.

46. *Affare azurro.*—Accipe parte j. de solpho vivo et parte doi de vitriolo romano spolverizati subtili et parte doi de argento vivo et mecti le sopradicte polve in una ampolla bene incorporate et cocilo commo lo cinabrio et quando sera cocto fara fumi azurro alhora tolli via el foco et quando sera freddo macinalo et serbalo.

47. *Ad azurrum faciendum.*—Summe once doi d'argento vivo once tre de solphino et once quatro de sale armoniaco et macina bene subtili lo solfo et lo sale predicto poi tolli una ampolla che habia el collo longo et inluta cum luto de sapientia de fora grosso uno deto dal collo ingiù et lassalo sciuctare poi mecti queste cose sopradicte in nel ampolla et obtura la bocca de lampolla cum suvera et lassali in el mezo uno foro picolino poi mecti questa ampolla in uno pignatto novo non vitriato quasi pieno de cenere crebellata poi pone lampolla in la dicta cenera che sia coperta fino al mezo del collo de la dicta cenera et poi ponila dicta pignatta al foco de carbone et dalli el foco lento lento da prima per 4 hore poi lo vieni crescendo per infino attanto che vedrai uscire de la dicta ampolla fumi bianco o vero fumi azurro alhora subito levali el foco et lassa refredare poi rompe lampolla et macina lo azurro in porfido subtili poi serbalo in loco senza ayere et haraj bono azurro.

48. *Ad faciendum azurrum.*—Accipe alumi de rocho vitriolo romano sal netrio ana oz. j, e stilla per lambicco poi serba laqua bene opturata poi torrai calcina de cociole dova et macinala cum la dicta aqua stillata et lassa secare et cosi farai 3 o 4 volte poi toraj aceto fortissimo et per omne libra daceto torai oz. 5 de verde ramo et macinalo cum lo dicto aceto poi lo pone a stillare per lambicco et cum quello aceto stillato imbevera et macina lo sopradicta calcina 3 o 4 volte et poi lo secca et serbalo in bursia corj et haverae bello azurro et cosi

² This recipe is of the same nature as that in No. 30, but the proportions vary.

it in a leather purse, and you will have fine azure. You may do the same with lime made from travertine or marble, but lime made from egg-shells is better.

49. *To make azure.*—Take a flask of pure copper, and put lime made from white marble into it, so as to fill it half way; then fill it with strong white vinegar, and put it, well covered over, into a warm place for a month; then take it out, and grind the mass, adding to it some indigo, and put it away, and it is done.

50. *To make azure.*—Fill a glazed earthenware vase half full of urine; then take strips of copper, as thick as for a copper cauldron, and suspend them in the air at about two fingers' breadth above the urine; stop up the vase, and let it stand for two months, and you will see the azure upon the strips of copper; and if you wish to scrape them you may do so; and if you wish them to remain until they become quite brittle, they will become so in seven months.

51. *To make azure.*¹—Take of verdigris 2 oz., sal ammoniac 1 oz., white lead $\frac{1}{2}$ oz., pounded together; make them into a paste with oil of tartar, and put all these things into a glass vase luted with philosophers' lute, and put the vase into the oven for baking bread, and when the bread has been baked six or seven times the process will be completed.

52. *To make azure.*—Take indigo and verdigris well ground, and a great quantity of the juice of the euphorbia, and grind them well together. Place the mass in the sun, and dry it well; then wash it, and it will be good azure.

53. *To make azure from silver.*—Take 3 oz. of silver, and 1 oz. of copper; melt them together, and make them into very thin plates, and suspend them over the vapour of vinegar in a vase, well covered to prevent evaporation; then put the vessel into hot dung for thirty days; the azure will remain attached to the plates; then take it away, and renew the operation as long as the plates last.

¹ A repetition of No. 41. This recipe is given in "Secrets des Arts et des Métiers."

porai fare cum la calcina del travertino o marmo ma la calcina de le cocciole e meglio.

49. *Ad azurrum faciendum.*—Ahbeas ampulla de puro cupro et pone intus calcem de albo marmore ita ut dimidia sit et adibe acetum album fortissimum ut plena sit et eam pone in calido loco copertam optime per unum mensem postea extrahe et macina dictam massam adendo sibi de colore indici et repone et est factum.

50. *Ad azurrum faciendum.*—Tolli orina et meçtila in uno vaso de terra vitriato et el vaso vole essere per mita poi tolli piastre de ramo a modo de caldare grosso et meçtili in ayere che stia discosto dalla orina doi deta et obtura el vaso et lassa stare a termine de doi mese et vederai sopra le lamini lo azurro e se tu le vorai radare se ponno radare et se tu le volesscie lassare stare tanto che tucti vengano frangibili et farasse in secte mesi.

51. *Affare azurro.*—Recipe verderamo oz. 2 sale armoniaco oz. j biacha oz. $\frac{1}{2}$ spulve[ri]zati insiemj et impasta cum olio de tartaro et pone tute queste cose in uno vaso de vetrio lutato de luto philosophico et metilo in lo forno del pane quando sera cocto el pane 6 o 7 volte el sera facto.

52. *Affare azurro.*—Tolli indico verderamo bene macinato habbi multo lacte de tortomaglio et macina bene insiemj poi lo pone al sole a seccare bene poi lo lava e de facto bono azurro.

53. *Affare azurro de argento.*—Ahvve oz 3. d'argento e oz. j. de ramo, et fondi insiemj et fanni piastre sutilissime et polle sopra alo vapore de laceto sospese in uno vaso bene coperto che non possa evaporare poi lo poni socto lo litamj bene caldo per 30 di et lo azurro remara atacato ale lamine et levalo via poi reitera la pratica per infino le lamini saranno bonne.

54. *To make azure.*—Take of sal ammoniac 1 oz., verdigris 3 oz., and mix them together with water of tartar until they are as soft as dough, or rather softer. Put the mixture into a hot oven in a well-closed glass vase, and let it remain there for several days, and you will find good azure, which you must keep in a sealed jar, or in a bag of chamois leather.

55. *For the same, in another way.*—Take 2 oz. of burnt copper, 1 oz. of sulphur, and 1 oz. of tartar of wine;¹ grind the whole together, and make it into a paste with urine passed three times through a filter, or with strong white vinegar; then put it into a glazed vase, and boil it over the fire, stirring it well. Take it off, and put it into a glass vessel; stop up the mouth of it, and let it remain in the sun for fifteen days, and you will find azure; and if it is not crystallized with the urine or vinegar, leave it in the oven after the bread is taken out.

56. *For the same, another way.*—Take 1 lb. of very fine brass filings, 3 oz. of quicklime, 5 oz. of tartar pounded fine and calcined, for it will be better than raw, 4 oz. of terra verde, 1 oz. of sal ammoniac; mix all these things together with strong white vinegar, so as to be like dough, or rather thick, and put the mixture into a glass or glazed earthenware vase, well closed, so as to exclude the air, and place it in horsedung or the refuse of grapes, and let it remain there, well covered up at the depth of about two or three feet, for fifteen days; then take it out, and grind it well on porphyry, and put it into a leather purse; and know that this azure is better for walls, upon mortar, than for any other purpose.

57. *To make azure for walls, upon mortar.*—Take finely-powdered and very fine white lime from marble, and put it into a new glazed jar, so as to fill it about half, or rather less; and know that the lime must be very fresh and fine. Then fill the jar with very strong red or white vinegar, and lute the jar so as to exclude the air; put it under horsedung, or under the refuse of wine, for one month or forty natural days; then open

¹ An impure supertartrate of potash.

54. *Ad faciendum azurrum.*—Recipe salis armoniaci oz. j, viridis eris oz. 3, confiantur simul cum tartari aqua donec molle fiat sicut pasta vel modicum plus et ponatur in furno calido in vase vitrio per otime obturato et stet ibi per aliquos dies et invenies azurrum bonum et reserva in vase plumbato sive saculo camusii.

55. *Ad idem per alium modum.*—Accipe oz. 2 rami combusti et oz. j sulphuris et oz j feccis vini et terantur omnia et impastentur cum hurina distillata per filtrum tribus vicibus vel impasta cum aceto albo forti postea pone in aliquo vase vitriato et bulliat ad ignem et commisciatur bene postea elleva et pone in vitreo vase et bene os ejus obtura et dimicte stare ad solem per 15 dies et invenies azurrum et si non fuerit zellata hurina sive aceto dimicte in furno post extractionem panis.

56. *Ad idem per aliam formam.*—Summe limaturam rami subtilissimam lb. j. calcis vive oz. 3 tartari pulverizati subtili et calcinati quia melius erit quam crudi oz. 5 terre viridis oz. 4 salis armoniaci oz. j omnia confice insimul cum acerrimo aceto albo ut sit in modum paste et potius magis spisse et pone in vase vitrio vel terreo vitriato per optime obturato ut non respiret et pone sub equino fimo vel venatias et ibi maneat bene coperto per tres vel duos pedes circum circha per 15 dies demum extrahe et trita bene eum in porfido et reponet in bursia camusi. Et scias quod hoc azurum magis bonum est per muros in calcina quam in aliis rebus.

57. *A fare azurro per muro in calcina.*—Havve calcina de marmo bene sotili et canida et metila in una pignatta vitriata nova tanto che sia mezo o mancho piu tosto che piu et sappi che la calcina vole esser freschissima et bene subtili poi empila pignata de fortissimo aceto rosso o bianco poi copri la dicta pignatta cum luto che non respire poi la poni sucto lo litami de cavallo o vero socto la venaccia per uno mese o 40 di naturali

the vase, and you will find at the top bright azure good for walls, and underneath it impurities—that is, the lime—which you may throw away.

58. *To make azure by means of aqua fortis.*—Take of Roman vitriol 1 lb., of refined saltpetre $\frac{1}{2}$ lb., and 4 oz. of vermillion, grind all these things together very finely, mix them well together, then put them in a bottle and distil them through an alembic with a gentle fire at first, and receive the first water until the alembic begins to get yellow, or to redden; then remove the recipient, and put on another, and lute the edges well, so as to be air-tight, and receive the next water, and throw away the first water, for it is useless for this operation, and then increase the fire, and let the recipient have all the vapours from the large bottle as long as you see any come off, and keep this water in a vessel well closed so as not to evaporate; and this water is useful for making good azure almost like ultramarine. It is also useful for gilding all kinds of things.¹

First, if you wish to make azure, take calcined tin, and put it into a glass or glazed jar, and pour some of the before-mentioned aqua fortis over it, so as to stand half a finger's breadth over the oxide of tin; let it stand so until the calcined tin is well sunk to the bottom, and is highly coloured; then pour off the water, and you will find good and fine azure, which you may sell for 5 gold ducats the pound.

If you wish to make calcined tin, take tin and put it into an earthenware vase, place it on the fire, and let it melt, and when it is melted, continue to mix it until it cools, and do not let it clog together, and you will have a calx (oxide) with which you may make the azure. You can also make the calx of tin in another way. Take tin filings and put them into a glazed jar and pour over them distilled vinegar, and cover the jar closely. Place it in dung, and let it remain until the tin and vinegar

¹ The description in the text appears to be imperfect. It is probably an inaccurate version of the recipe in No. 32, for making "an azure better

poi descopre el vaso e troverai de sopra azurro bono per muro et bello et de socto fecia cio e calcina la quale gietta via.

58. *A fare azurro per via daqua forte.*—Tolli vitriolo romano lb. j salnitrio affinato lb. $\frac{1}{2}$ et cinabrio oz. 4 et tucte queste cose macina bene subtilissimi et poi le mista insiem multo bene et polle in una boccia et destillale per lambicco prima cum lento foco et colglie la prima aqua per infinj che lo lambico se comincia affare croceo o vero rosigiare alhora remove l'ampolla et mectinie una altra et tura bene le junture che non spirano et coglie l'altra aqua et la prima gietta via che non vale niente in questa opera et alhora cominza a fare un poco maggiore foco che prima et fa che lampolla receva bene i fumi da la boccia grandj per infino che tu vedi che ne vieni et serva questa aqua ben turata che non respire et questa aqua e bona da fare azurro bono quasi simili a lo azurro oltrammarino. Et e bona ancora da dorare omne lavoro.

Prima se tu voli fare azurro tolli calcina de stagno et metila in uno vaso de vetrio overo vetriato et desopra ce pone de la dicta aqua forte dicta desopra tanto che sopravanze mezo deto de sopra ala calcina et lassa stare cosi tanto che la calcina sia bene andata al fondo et bene colorita poi sepera laqua et trovarai azurro bono et bello del quale azurro venderai ducati 5 doro la libra.

Et se tu volesci fare la calcina de stagno tolli delo stagno et pollo in uno vaso de terra et metilo al foco et lassalo desfare et commo e disfatto non finire mai de mistarlo per infino a tanto che se fredda et non lo lassare apicare insiemj et sera facta calcina cum la quale poi fare el dicto azurro. Ancora poi fare la dicta calcina de stagno in uno altro modo: tolli limatura de stagno et polla in una olla vitriata et disopra ce pone aceto distillato per lambiccho et copri bene la dicta olla et polla sub fimo et lassa tanto stare che lo stagno et aceto siano

than German azure, which, in appearance and colour, equals ultramarine."

are dissolved, because it will then be converted into a very fine and almost impalpable powder; and with this you can make the azure.

If you wish to gild iron or any other thing, take the thing you wish to gild, and varnish it, and let it dry; then draw what you like on the varnish, and put some of this water upon it. Warm it at the fire, and when it is hot, rub it with a linen cloth, and it will be well gilded.

B 59.¹ Take strong ley, and as much as you like of indigo, grind it with the ley, according to the depth of colour you wish for. For example, if you wish the colour to be very deep, grind more indigo with the cold ley, and then make the ley boil with the indigo for the space of one *miserere*, and afterwards remove it from the fire, and immediately put a little roche alum in powder into it, and mix it and let it cool until it is tepid or almost cold. Then put it into a piece of linen and rub it upon a chamois leather skin, and the skin will become blue. Dry it in the meridian sun or at the fire, and when it is dry, rub it with your hands and make it soft, and it will have become a beautiful blue skin, &c.

¹ The title is wanting. It appears to be a recipe for dyeing skins rather than for painting. The hand-writing is more recent than that in the preceding chapters.

disoluti perche se convertira in polvere subtilissimo quasi senza tatto et cum questo poi fare el sopra dicto azurro.

Et se tu volesse dorare ferro o altro tolli la cosa che tu voli dorare et invernicala et lassa sciucare poi designa quello che te piace in la dicta vernice poi vi meti desopra de la dicta aqua et scald(a) al foco poi commo e bene calda sfrega cum panno de lino et vira dorato bello.

B 59. Recipe liscivium forte et indicum quantum vis et macina eum cum dicto liscivio et pone tantum emdicum secundum vis ut sit coloratum viz. si vis ut sit magis coloratum pone magis indicum ad macinandum cum dicto liscivio frigidum demum fatias dictum liscivium bollire cum dicto indico per spatium unius miserere et postea extrahe ab ingne et immediate pone in eo unum modicum aluminis rocci pulverizati et misce et dimicte frigidari dummodo tepidum fiat et quasi frigidum demum pone eum in petia linea et frica super pellem camusciam et fiet azurram et sicca ad meridiem aut ad ingnem et quando erit sica frica manibus et reduc eam ad morbitatem et erit facta pulcram pellem turchinam et cetera.

HERE BEGINS THE THIRD CHAPTER

ON MAKING AZURES FROM THE JUICES OF HERBS, WHICH ARE USED ON PAPER, ON MINIATURES, ON CANVAS, AND ON GESSO; AND FIRSTLY, THAT IS TO SAY—

60. *To make azure from the juice of herbs.*—First collect in the beginning of the month of July those violet flowers which grow in the fields, and with the juice of them fill a glass flask, and pour strong vinegar or urine into it until it is full; let it be well covered over, and put it in dung or in a heap of quicklime, or in the refuse of grapes for a fortnight, then take it out, and you will find your azure made.

61. *Also, to make azure from herbs.*—Take the blue flowers which are called “oculos pulcini,” and boil them with vinegar and powdered resin and roche alum, and let the vase be airtight; afterwards strain the liquor through a cloth, and you will have a good blue colour. You may keep the dried flowers for a whole year.

62. *On the same subject, to make blue from herbs.*—Take the flowers of wild peas, and select only those petals which are inside and above the others, and which are of a dark purple, and pound them; extract the juice from them, and incorporate the juice with white lead, and you will have a durable and tried blue colour.

63. *To dye linen cloth blue with juice of herbs.*¹—Take the berries of the “chacabassia,” and bruise them well on a thick and white, but not new, linen cloth, on both sides of the cloth. Then take a vessel full of urine, and put the cloth over it so as

¹ This appears to be a version of one of the recipes for “Pezzette.” I cannot find the explanation of the term “Chacabassia”; perhaps, as was suggested to me by a gentleman well acquainted with the subject,

INCIPIT TERTIUS CAPITULUS

DE AZURRIS FIENDIS DE HERBARUM SUCCIS QUIBUS UTUNTUR
IN CARTA SUPER MINII ET IN TELA ET IN GISSO ET PRIMO
VIDELICET—

60. *Ad faciendum azurrum ex succo herbarum.*—Primo collige in principio mensis Julij illos flores violatos qui nascuntur in campis et ex succo eorum impleas unam ampullam vitream et desuper infunde fortem acetum vel orinam usque ad summum et sit optime copertam et pone sub fimo aut sub acerva calcis vive vel sub venatias per 15^{im} dies postea extrahe et invenies azurrum factum.

61. *Ad idem de azurro herbarum.*—Collige flores azurrinos qui vocantur oculos pulcini et fac eos bullire cum aceto et cum ragina pulverizata et aluminis rozi ita quod vasculum non possit aspirari postea collabis per pannum et habebis bonum colorem azurinum et poteris servare per totum annum flores siccos.

62. *Super eodem de herbarum azurro.*—Recipe fiore de pesselli salvatice et tolli solamente quello fiore che e de dentro in suso l'altro fiore el quale e pavonazo scuro et quelli pista et cavani lo sugo et incorpora lo dicto sugo cum biacca et haverai colore cilestro durabili et provato.

63. *A fare la peza azurra de sugo derbe.*—Tolli delle pomellj de la chacabascia e sfregali bene in uno panno de lino grosso et bianco non novo da omne lato de la pezza poi tolli uno catino pino de orina poi pone questa pezza sopra a questo

it may be the same as "scaldabassa," which is mentioned in the Le Begue MS., and which was certainly a blue colour, because it was used with yellow to produce a green colour.

not to touch the urine, and let it stand for three or four days. Then take it up and it will have become blue; and when you want to use it take a small piece of that cloth, put it into a shell; add a little gum water, and let it stand to soak for the space of one *miserere*; then press it, and with what you press out, paint what you like on paper, on miniatures, or elsewhere, and it will be a fine colour.

64. *To make blue in another manner with juice [of plants].—* Summe stercho canino bianco, et spolverizalo bene subtili et stemperalo cum orina ad modo de collore et cum questo stercho stemperato cum orina, scrive, depinge quello che tu voli et lassalo sechare, poi tolli lo sugo delli granelli dellebe, et pollo cum lo pennello sopra le lettere o fogliami della mistura de lo stercho et subito diventara collore azurro bello, et se misti el dicto sugo cum lo stercho, et cum lorina, et mistica bene insiemj, vira azurro, ut supra.

65. *How to grind azure to use with the pen and in body colour.—* Take the azure, and put it into a glazed pan; then add some very clean honey and incorporate them well together, then grind the honey with the blue upon marble or porphyry until it becomes an almost impalpable powder. When it is ground fine put it back into the pan and wash it several times with warm water, and when it is well washed with warm water, wash it with cold water, and after each time let the azure sink to the bottom. Continue this until it is well washed, cleaned, and purified; then take the azure and put it to soften in clear and clean ley in a glass vase, such as a tumbler, and let it stand for the space of seven days; change the ley every two or three days, and then wash it well with fresh and clear water, and let it dry in the shade in a place where no dust will get to it. And if you wish to use it as a body colour, distemper it with size made from clippings of white chamois leather and it will be good. And if you wish to use it with the pen or for miniatures, take the azure and distemper it with glue made from parchment clippings, or with gum water and prepared white of egg, and it will do well.

catino per modo che non tochi lorina et lassala stare 3 o 4 di et poi la leva et sera diventata azurra et quando la voi operare tolli uno poco de quella peza et metila in una cocia et metice uno poco daqua gommata et lassa stare a mollo per uno misere et poi lo spremi et cum quella spremitura dipenge quello che te piace in carta sopra aliminii o altrove et sera bello colore.

64. *Affare azurro per altro modo cum sugo.*—Summe stercho canino bianco et spolverizalo bene subtili et stemperalo cum orina ad modo de collore et cum questo stercho stemperato cum orina scrive depinge quello che tu voli et lassalo sechare poi tolli lo sugo delli granelli dellebe [ellera ?] et pollo cum lo pennello sopra le lettere o fogliami della mistura de lo stercho et subito diventara collore azurro bello et se misti el dicto sugo cum lo stercho et cum lorina et mistica bene insiemj vira azurro ut supra.

65. *Commo se macina lo azurro per adoperare a penna et fare corpe.*—Accipe lo azurro et mectilo in una scudella vitriata et poi mectivi del mele ben necto et incorpora bene insiemj poi macina el mele insiemj cum lo azurro supra marmo o porfido et macinalo tanto che venga quasi senza tacto et quando sera bene macinato aremetilo in quella scudella et lavallo piu volte cum aqua tepida et poi che sera bene lavato cum laqua tepida lavallo cum aqua chiara et da luna volta et laltra lassa andare lo azurro al fondo et tanto continua che sia bene lavato purificato et necto poi tolli lo dicto azurro et metilo amollo in ranno da capo necto et chiaro in uno vaso de vetrio commo e uno bichiere et lassalo stare per spatio de 7 di et omne doi o 3 di mutali lo ranno novo poi lo lava molto bene cum aqua fresca et chiara et lassalo sciugare a lombra in loco che non vi vada polvere. Et se tu el voli adoperare per fare corpe distemperalo cum colla de retalgie de camoscio bianco et stara bene. Et se tu el voli per operare appenna o per minij tolli de lo azurro et distemperalo cum colla de rasura de carta o vero cum aqua gommata et cum chiara dovo preparata et stara bene.

66. *To mix azure for writing.*—Take whatever kind of azure you like and grind it gently with prepared white of egg and ley upon porphyry, and then put it into a horn. When it is quite settled, throw away that ley and white of egg, and do this three or four times, and the last time throw away the ley, drain it and then let the azure dry. When you wish to use the colour add a little gum water to it and mix it well; and when it is settled, throw away that gum water and put some fresh, and use the colour. Some mix it with white of egg, but if you use white of egg, you must renew it every day, because if it remains too long, it turns the azure black. And if you put in it some wax from your ears, it makes the colour flow much better. Some persons say that if you put gum water into the azure, it turns black; and it is said that the azure should be ground with ley made from the ashes of the oak or with calcined ashes. Distemper it, when it is dry, with white and yolk of egg, and this makes it more beautiful, more shining, and more pure.

67. *The way to refine the azures when they are impure.*—If you have azure which is not clean, take the azure and put it in urine to soak for the space of one month, and then wash it with clear water, and distemper it as above, and it will become clean and beautiful.

68. *For the same purpose.*—Take the azure and distemper it with white of egg and tragacanth, well beaten and incorporated together, and distemper your azure with this.

69. *To purify azure.*—If the azure is too earthy, it may be purified as follows:—Take white and clean ashes, and an equal quantity of quicklime, and let it be very white; then take equal quantities of vinegar and water, and put them into a new and clean jar, and boil them with the ashes and lime, and afterwards let them cool and settle, and with that ley wash the azure, and know that after such washing the azure will appear black. Then wash the blackened azure with white wine, and let it dry, and put it into a shell with about a fourth part of gum water.

70. *To colour the azure.*—Take verzino, scrape it fine with

66. *A distemperare azurro per scrivere.*—Reccipe de qualunque sorta de azurro te piace et macinalo legiermente cum chiara dovo preparata et lisciva da capo sopra porfido poi mectilo in lo cornecto et commo ello e bene reposato et tu gietta via quella liscia et chiara et cosci fa 3 o 4 volte et l'ultima volta gietta via la liscia et lasselo bene scolare et lasselo seccare. Et quando tu lo vorai operare mectice uno poco daqua gommata et misticalo bene et commo e bene possato gietta via quella aqua gommata et mectice della nova e doperalo. Alcuno lo tempera cum chiara et aqua gommata. Ma se tu lo conciaraj cum chiara se vole renovarla quasi omne di perche stando ce troppo fa lo azurro negro. Et se tu ce misti de la bruttura de le orecchie lo fa piu corrente assai. Et alcuni dicano che mettendo de laqua gomata in lo azurro diventa nero et dicano che se de macerare in liscia facta de cenere de cerro o cenere recotta et distemperarlo poi quando sera sciuto cum chiara et torno dovo et questo lo fa piu bello et piu lucente et piu puro.

67. *El modo dafinare li azurri quando fussero grossi.*—Se tu havessi azurri che non fossero necti tolli lo dicto azurro in lorina amolli per lo spatio de uno mese et piu poi lo lava cum aqua chiara et distemperalo commo e dicto disopra e vira necto et bello.

68. *Ad idem.*—Accipe lo azurro et temperalo cum chiara dovo et draganti sbatuti bene insiemj et bene incorporati luno cum laltro et con quello tempera el tuo azurro.

69. *Ad purgandum azurrum.*—Si azurrum est nimis terrestre sic purgatur. Recipe cininerem candidum et mundum et totidem de viva calce et sit bene alba et acetum et aquam equaliter et mitte in vase novo et mundo et fac simul cum cineribus et calce bulire postea permite in frigidari et clarificari et cum tali liscivia lava azurrum et sias quod post talem lavationem azurrum apparebit nigrum et deinde lava cum vino albo dictum azurrum nigrum et permiete siccare deinde pone eum in coculeam cum aliquantulo aque gumate per quartam partem.

70. *Ad colorandum azurrum.*—Reccipe verzinum et subtiliter

glass, and put the scrapings into prepared white of egg for a day and a night, so that the raspings may be covered with the white of egg; add a little pounded roche alum, then strain all these ingredients through a piece of white linen, and temper the azure with this coloured white of egg.

71. *To "multiply" your azure.*¹—Take azure with a little ceruse, mix them together, and distemper them with white of egg; and if you wish the colour to be paler, add more ceruse, and it will be "multiplied."

72. *To colour your azure very well.*—Take 3 oz. of oil of bitter almonds, and an equal quantity of olive oil, put them into a stone vase with azure, and boil them, without smoke, for 7 hours; do this three or four times, and afterwards wash the azure with tepid ley, then with cold and clear water, so as to clean it well. Then dry it, and it will be well coloured, and you may temper it as you like.

73. *To make indigo.*—Take the herb woad and pound it very fine, and make it into little balls like apples; then take for every pound of woad two ounces of common salt, three ounces of sulphur vivum, and one ounce of roche alum; grind all these things with the herb, and afterwards put them into a copper vessel of clear water, and mix them to the consistence of sauce not too thin, then put the vessel over a clear fire, and let it remain until it becomes like dough; next put it on a table, and spread it out rather thin, and afterwards cut it with a knife in any manner you please and let it dry, and you will have good indigo.

74. *To make indigo.*—Take two ounces of "gesso sottile," and grind it with 10 oz. of dried woad, that is to say, the flower (or froth), and grind it well; then mix a little albumen of eggs, that is to say, prepared white of eggs, with it, and incorporate the whole well together, and dry it in the sun, and when it is dry cut it into pieces just as you like. And note, when you

¹ To "multiply azure," *i. e.*, to increase the quantity. In the present instance this is done by adding white to it, which also diminishes the inten-

rade cum vitro et pone rasuram illam in clara ovi preparata per diem et noctem ita quod rasura illa sit coperta a dicta clara cum modico aluminis rocci pulverizati deinde colabis hec omnia cum petia panni lini alba et cum predicta clara colorata temperabis azurrum.

71. *Ad multiplicandum azurrum.*—Tolle azurrum cum modico ceruse et misce simul et distempera cum clara ovj et si vis magis clarum mictre plus de cerusa et multiplicatur.

72. *Ad colorandum azurrum optime.*—Invenies oleum amangdolarum amarum oz. 3 et totidem olej olive et pone in lapideum vasem et fac bullire cum azurro sine fumo per 7 horas et sic ter vel quatuor faties postea abluere cum liscivio tepido deinde cum frigida aqua et clara ut sit bene mundum postea sicca et coloratum erit congrue et tempera eum quomodo vis.

73. *Ad faciendum endicum.*—Reccipe guatum in herba et eum pista valde bene subtiliter et fac pallottas sicut poma postea accipe pro omni libra dicti guati ontias duas salis comunis et ontias tres sulphuris vivi et untiam unam aluminis rocci deinde bene trita omnia simul cum dicta herba postea pone omnia in uno vase rameo cum aqua clarissima et stempera ad modum salse non nimis clare postea pone super ignem clarum et fac tantum stare ut veniat ad modum paste postea pone super unam tabulam et stende aliquantulum subtile hinc ad modicum incide cum gladio ut tibj placet et mite sicari et erit factum indicum finum.

74. *Ad faciendum indicum.*—Tolli once doi de gesso subtili et macinalo cum x once de guato secco cioe el fiore et macina bene subtili et poi ce mistica uno poco de albume dova cioe chiara dova preparata et incorpora omne cosa bene insiemj poi el pone asciugare al sole et quando e seccho fannj pezi commo te pare. Et nota che quando tu el macini mectice

sity of the colour. The term "multiply" was much used by the old Alchemists in the above sense.

grind it, mix with it a little roche alum dissolved in water, and it will be good and fine indigo.

75. *To make fine indigo.*—Take one part of flower of woad, which flower is collected in the dyers' vat when they are boiling woad; bake it well in an earthenware shovel, until it is well burnt; then grind it fine, and take 5 parts of the white earth which the fellmongers use,¹ pound it and mix it well with the powder of the woad; afterwards grind the whole with clear water upon a stone, like paint, then spread it on a smooth table, and let it dry a little in the sun; afterwards break it into small pieces, and let it dry again in the sun. Then take some of the first composition, and make it of the consistence of a rather thin soup, and put the pieces into it to soak; then take them out and dry them in the sun or at the fire, and if the colour is not sufficiently deep, renew the process as often as you think proper; afterwards dry it, and keep what you have made.

76. *To make indigo.*—Take gesso, ground very fine, three parts, and flower of woad six parts; mix and grind them well together until they become like paste of a good colour. Then take alum water made with roche alum, and again wet up this gesso and flower, add more fresh flower of woad until it is as thick as porridge; and before you put in the alum water you must spread the mixture of gesso and woad on marble or hard stone until it is very dry. It must then be wetted up again with the alum water; afterwards spread it out, and let it become very dry, and preserve it.

77. *To make indigo another way.*—Take flower of woad, and make it up into a paste with urine and strong vinegar; make a cake of it, and dry it in the sun, and if it is pale add more flower of woad to it, until it becomes of a fine colour; then cut it into pieces, and finish drying it, and it will be done.

78. *To make indigo.*—First you must know that the various sorts of this colour are made of a certain herb which is called

¹ There is no doubt that this was lime.

uno poco dalumj de rocho dissolto in aqua e sera bono et bello indico.

75. *Affare bello indico.*—Reccipe partem unam floris guati qui flos colligitur in caldarea tintorum quando guatum dequoquatur et ipsum bene coque in pella terrea donec peroptime comburetur postea tere eum subtile deinde accipe terram albam qua utuntur pelliparij et pulveriza et tolle de ea partes 5 et bene missia cum pulvere predicto guati postea cum aqua clara omnia simul conjunge supra lapidem ad modum colloris deinde extende supra tabulam politam et dimitte aliquantulum sicari ad solem postea fac parva frustra et iterum dimitte sicari ad solem hoc facto acipe de primo composito et fac unum brodum aliquantulum currens et impone ipsa frustra ut imbibantur deinde extrahae et sicca ad solem vel ad ingnem deinde si non est satis coloratum reitera donec videtur tibi postea sicca et serva quod factum erit.

76. *Affare indico.*—Tolli gesso macinato subtilmente per terza parte e fiore de guato per sesta parte et mistica et macina bene insiemj tanto che venga ad modo de pasta che habbia bono collore poi tolli aqua alumata cum alumj de rocho et reintridi questo gesso et fiore de novo cum la dicta aqua alumata cum piu fiore de guato novo tanto che sia commo una farinata. Et nanti che tu ce mecti laqua alumata se vole stemdare lo gesso et lo fiore in uno marmo o vero sasso vivo in fino che e ben secho poi se vole reintridare de novo cum la dicta aqua alumata poi lo stende et lassalo seccare si che sia ben secho et ripollo.

77. *Affare indico per altram viam.*—Reccipe fiore de guato et impasta insiemj cum orina et aceto forte et fanne uno migliao et secalo al sole e se ello bianchegiasse metice piu fiore de guato et cusi fa tanto che habbia bello colore poi ne fa peze e fornisce lo de seccare et sera facto.

78. *Ad faciendum indicum et confitionem ejus.*—Primo sciendum est quod genera istius coloris fit de quadam herba que

woad, and this herb is boiled down in a jar until no part of it remains ; it is then dried, and is called by different names ; it is made in various places, and is nearly perfect azure.

79. *To make indigo.*—Take prepared gesso, ground fine, and mix it with flower of woad, and grind it until it becomes like soft and watery paste, and has a good colour. Then take roche alum, and distemper it with hot water ; then wet up afresh the gesso and flower with the said alum water, so as to be like a thin porridge ; let it remain so until it begins to shrink, then spread it out, and let it dry ; afterwards wet it up again with the alum water and flower of woad, and spread it out again on a plank or table of polished walnut wood, or well-polished marble or stone. When nearly dry, cut it into pieces just as you like, and let it finish drying, and it will be good indigo.

80. *To make indigo in another way.*—Take flower of woad and very white starch, knead them together with urine prepared and strained through a filter, and strong white vinegar, equal parts of each. Make the whole into a cake, and dry it in the sun ; and if it is not sufficiently coloured, add to it more flower of woad, and put so much of it that it may be of a lively colour, and it will be done.

81. *To make indigo by another method.*—Take woad in the herb, and pound it well, and put it in the sun in a vase, and let the sun always shine upon it, and let it stand so for several days, and every day wet it with urine until it breeds worms, and it will produce large worms of a blue colour. Then take these worms and pound them, and extract the juice of them by means of a linen cloth, not too tight ; then let the mass remain by itself, and when it begins to shrink make it into a cake like dough, not too thick, and put it to dry ; and when it is nearly dry, so that the juice can be pressed out well, cut it in pieces just as you like, and let it finish drying, and it is done.

vocatur guatum et illa herba coquetur in vase donec nil de substantia remaneat deinde desicatur et diversis nominibus nominetur et in diversis partibus conficitur et quasi azurrum est.

79. *Affare indico.*—Tolli gesso curato macinato subtili et mistalo cum fiore de guato et tanto lo vieni macinando che sia commo pasta intrisa brodosa per modo che habia bono collore poi tolli alumj de rocho et distemperalo in laqua calda poi reintridi de novo lo dicto gesso et fiore cum la dicta aqua alumata per modo che sia commo una farinata liquida e lassalo cuscì stare per infino che se cominzia a stregnare poi lo stende e lassalo sciugare poi de novo lo intridi cum la dicta aqua alumata e fiore de guato e de novo lo stende in una tavola de noce o asse bene polita o marmo o petra bene polita e lassala quasi secare poi ne fa li pezi a tuo piacere e lassalo fornire de secare et sera bono indico.

80. *Affare indicho alio modo.*—Ahvve fiore de guato et amido bene canido e impasta insiemj cum orina preparata e stillata per filtro et cum aceto bianco e forte tanto de luno quanto de laltro e fanne uno migliacio e secalo al sole e se venisse che non fosse bene colorito metivj piu fiore e tanto vi ni metti che habia bono e vivo collore e de facto.

81. *Affare indicho per altra forma.*—Tolli guato in herba e pistalo bene e mettilo al sole in uno vaso e fache lo sole li dia di continuo e lassalo stare piu di e omne di lo bagna cum orina per infino a tanto che inverminisce e fara verminj grossci de collore azurro poi tolli quei verminj e pistali e tranne el sugo per uno panno de lino non troppo stretto poi lassalo riposare per se medesimo e commo se cominzia a stregnare e tu ne fa una focacia come se fusse pasta non troppo grossa e mettila a seccare e quando sera a presso che secca che lo sugo se tirera bene e tu ne fa in pezze commo te pare et lassali compire de secare e de facto.

HERE BEGINS THE FOURTH CHAPTER

ON MAKING GREENS FROM COPPER AND FROM THE JUICES OF
HERBS IN VARIOUS MANNERS. AND FIRST—

82. *To make verdigris.*—Take very thin slips of copper, and put them into a vase, and then place the vase three palms deep in horsedung, underground, in a damp place, and let it remain thirty or forty days; then take it out, and rub the slips well with very strong vinegar; then put them back under the dung in the vase, and let them remain well covered for the space of one month, when the verdigris will be formed.

83. *To make verdigris.*—Take a copper pot, with a cover that can be luted on to it, and fill it with very strong vinegar, then put on the cover, and let it remain sixty or seventy days underground in a warm and damp place; then take out the vase, and scrape away the verdigris that adheres to the bottom; then put back the vinegar, and return it as before, and continue this as long as any of the basin remains.

84. *To make verdigris.*—Take plates of copper, and suspend them over the vapour of strong vinegar in a jar covered with clay and well closed, so as to be air-tight; then put the jar into dung or the refuse of grapes, in the time of the vintage, for the space of fifteen days, when you must open the jar, and you will find the verdigris adhering to those plates. Scrape it away, and return it as before.

85. *To make verdigris.*—Take very thin copper and cut it into pieces of half an ounce or one ounce each; arrange them in a glazed vase with common salt—that is to say, one stratum of copper and another of salt; then fill the vase with strong vinegar, and cover it with lutum sapientiae; put it underground in a damp and warm place for a month, and you will have good verdigris.

INCIPIIT QUARTUS CAPITULUS

DE FIENDIS VIRIDIBUS RAMIS ET DE VIRIDIBUS FACTIS CUM
ERBARUM SUCCIS IN DIVERSIS MODIS. PRIMO

82. *Ad faciendum viridem ramum.*—Accipe fecte de ramo subtilissimi et mectile in uno vaso e poi lo pone socto lo litami de cavallo socto terra in loco humido socto tre palmi et lassalo stare 30 o 40 di poi el tera fora et sborfa molto bene cum aceto fortissimo le dicte lamine poi le ritorna socto quello litami in quello vaso et stiano bene coperte per spatio duno mese et sera facto verderamo.

83. *Ad viridem herem faciendum.*—Tolli uno catino de ramo cum uno coperchio che li stia sogillato et inpe lo catino de fortissimo aceto poi lo copri cum lo suo coperchio et lassalo stare per 60 di sosto terra che habia caldo et humido poi tolli fora el vaso et rade via el verderamo che se teni al fondo poi remectili suso quello aceto et tornalo al modo disopra et fa similmente per infino a tanto che lo catino ne mena.

84. *Ad faciendum viridem ramum.*—Summe le piastre de ramo et sospendi le sopra alo vapore de lo aceto forte in una pignatta coperta cum creta bene obturata che non spire poi lo poni in lo litami o vero venacia al tempo de vendemia per spatio de 15 di poi apre la dicta pignatta et troverai el verde ramo che sera apicato a quelle piastre et rade via quello et poi lo torna al modo sopradicto.

85. *Ad viridem ramum faciendum.*—Habbi ramo subtilissimo et fannj peze de meza oncia o duna oncia luno et acconciale in uno vaso vitriato cum sale communo cioe uno strato de lamine et uno de sale poi impe lo vaso daceto forte et coprilo vaso cum luto de sapientia et mectilo socto terra per uno mese in loco humido et callido et sera facto bono verderamo.

86. *To make green for painting on gesso.*—Take 5 ounces of strong white vinegar, of copper-foil and Roman vitriol equal quantities, and a little alum; grind them all together, and let them dry, and when you want to use the colour distemper it with gum water, and it will make a good green.

87. *To make green.*—Take orpiment and indigo “de bagadon,”¹ and grind them well with water. When the colour settles, grind it again with gum-water, and it will make a green; and, if you please, take orpiment and grind it, and mix with it white lead and indigo, and do as before, and it will be green.

88. *For the same.*—Take viridem presimum and grind it with water; let it dry, then temper it with gum-water, and if you wish it lighter, put in a little more orpiment, and it will be of a good colour.

89. *To make a good green with buckthorn.*—Take small berries of buckthorn² 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 quattrini³ 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.

90. *To make green.*—Take indigo and grind it with plenty of saffron, and with a little white lead and gum-water, and it will become green.

91. *To make green.*—Take the juice of the plant “morella,”⁴ and incorporate it with white earth, such as the fellmongers use, and mix a little gum-water with it, and it will become green.

¹ The true Indigo.

² Spincervino. The *Rhamnus catharticus*, Sap green.

³ Quattrini. Small copper coin, worth about the fifth part of a crazia, or the 60th part of a Florentine lira; perhaps so called because a quattrino was of the value of four denari or piccioli, now no longer in use. Alb. Diz.

86. *Affare verde da dipengiare in gesso.*—Tolli once 5 de forte aceto bianco poi tolli battitura de ramo vitriolo romano ana et un pocho dalumi de rocho et macina omne cosa insiemj et lassalo secare et quando tu voraj operare stemperalo cum aqua gomata et sera bono verde.

87. *Ad viridem faciendum.*—Invenies aurum piumentum et indicum de bagadon et tere bene cum aqua et cum se residerit tere cum aqua gumata et fiet viridem et si tibi placet acipe de auropiumento et tere et simul misce de biacha et de indico et fac ut supra et erit viridis.

88. *Ad idem.*—Tolle viridum presimum et tere cum aqua et dimite sicari et deinde tempera cum aqua gumata et si vis magis clarum impone aliquantulum auripiumenti et congrue colorabitur.

89. *Affare verde bono cum spingerbino.*—Recipe granelli de spinogerbino quando sonno 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.

90. *A fare verde.*—Have indico et macinalo cum zaffarami asso et cum uno pocho de biacha et uno poco de aqua gomata et cum quella aqua gomata macina li sopradicte cose et vira verde.

91. *Affare verde.*—Tolli sugo de herba morella et incorpora cum terra bianca la quale usa li piliciarj et mistace uno poco daqua gomata et sera verde.

⁴ Solatro Nero, Cacabo, It. Black Nightshade, Eng. Solatrum hortense, vulgare, officinarum, uva vulpus, lupina-strychnos, Lat. Morelle, Morelle des Jardins, Fr. Hierba mora, Sp.

92. *To make a light green, excellent for miniatures.*—Take dark blue lilies, pound them well, and extract the juice from them; then take roche alum dissolved in water, and in this alum-water wet some pieces of white linen three or four times, and each time dry them in the shade; then wet the pieces of linen in the juice six or seven times, and each time let them dry well in the shade; then keep them closely shut up in a box, in order that the air may not have access to them. When you wish to use the colour, take a small piece of that linen and put it into a shell, and soak it in gum-water just sufficient to cover it. Let it stand so for a night; then press it well, and stir it about in the shell in order to extract the colour; and if you choose to make it more brilliant, put it to soak in prepared white of egg, and use it for miniature and for drawing leaves upon paper.

93. [*To make dark green.*—Take berries of buckthorn, not too ripe; pound them, and extract the juice from them, and then do the same as was directed in the other recipe for making light green.

94. *To make green.*—Take myrrh and put it into a glazed vase, and fill it with strong white vinegar for the space of several days. A scum will rise on the top of the vinegar, and that scum is good and fine verdigris.

95. *To make good green.*—Take honey and strong vinegar of each as much as you like, and incorporate them very well together; then put the mixture into a well-luted copper vase, place the jar a foot deep in every direction in warm dung, in a place where the sun shines strongly, and let it remain so for a fortnight; then take it out, and you will find all the matter converted into fine verdigris of a perfect kind.

96. *To make blue green.*—Take some of our own azure,¹ and saffron well soaked in clear water, grind it on a marble slab with the azure, and incorporate them well together until the colour becomes a fine green; let it dry in the shade, and dis-

¹ Probably azzurro de Lombardia, mentioned in No. 4.

92. *Affare verde chiaro per miniare optimo.*—Recipe li gilglj azurrini scuri e pistali bene et tranni lo sugo poi tolli alumi de rocho dissolto in aqua et in questa aqua alumata ce bagna le peze bianche de tovalgia doi o 3 volte et omne volta le sciuga alombra poi bagna la dita peza in lo dicto sugo 6 o 7 volte et omne volta la pone a sciugare alombra molto bene et poi la conserva in bossola bene serata acio non vengha laiere. Et quando la vorai operare tolli uno poco de quella peza et metila a mollo in aqua gommata in una coccia tanto che stia coperta da la dicta aqua et lassa stare per spatio duna nocte et poi la preme molto bene et rimenala in la coccia acio lo colore escha fora et se te piace per farlo piu lustro la poi porre a molle in chiara dovo preparata et usalo per miniare a fare fogliame in carta.

93. *Affare verde scuro.*—Ahve grani de spingerbino che non siano troppo maturi et pistali et cavane lo sugo et poi fa similmente commo e disopra dicto in laltra ricetta dalo verde chiaro.

94. *Affare verde.*—Tolli mirra e metila in uno vaso vitriato et impelo vaso de aceto forte bianco per spatio de alcuni di questo aceto fara fiore de sopra et quello fiore e bono verde ramo e fino.

95. *Affare verde bono.*—Ahve mele e aceto forte ana el tuo volere et incorpora multo bene insiemj poi lo pone in uno vaso de ramo bene coperto poi lo pone socto lo litamj bene caldo et stia in loco dove el sole ferisci forte et fa che lo vaso stia socto lo litamj uno pei per omne verso et lassalo cosi stare per 15 di poi lo cava fora et trovarai tucta la matheria convertita in verde ramo bello in grado perfecto.

96. *Affare verde azurro.*—Summe azurro nostramo e zaffaramj bene mollo in aqua chiara et atritalo sopra lo marmo cum lo azurro et incorpora bene insiemj tanto che vegna bello verde et lassa secare alombra et distemperalo cum aqua gommata.

temper it with gum-water. If you like, you may put instead of the saffron, yellow earth dyed with the juice of buckthorn,¹ and it will become green; or the juice of buckthorn only.

97. *To make a green water for painting on canvas.*—Take ripe French beans, and put them into a small bag of strong canvas, place the bag in a press, extract the juice, and set it to boil, and let it be reduced one-half. Then add some powdered roche-alum, and remove it from the fire, and it will be a good and fine colour.

98. *To make a natural blue green.*—Take azure of whatever kind you like in fine powder, and put it to soak in soft water; then take fine verdigris, grind it very fine with soft water, and add to it so much saffron as will make it a dark green. Then put it into a glass cornet and mix it well, let it rest so as to sink perfectly to the bottom, and the water will remain above the verdigris clear and of a green colour, and this green water must be separated cautiously from the verdigris. Next take some of that soaked azure, and pour off as much of the water as you can from it. Then take the green water, and throw it upon the azure, and mix them well together, stirring them with your finger, and you will have a perfect blue-green, and it will maintain its colour; and when it is dry, if you wish to use it, pour some of the green water upon it, and soften the blue-green with your finger, and if it is weak, distemper it with fine gum, and it will be a most perfect blue-green.

99. *To make good green.*—Take the pips of the “pero citri-no” which are ripe at the time of _____, and extract the juice from them; then take an equal quantity of white wine, and boil them down till reduced by one-half; then take roche alum in powder at discretion, and add it to the liquid when it boils; then take it off the fire and set it to cool, and when it has settled and cooled strain it, and keep it in a glass vase, and use it for painting.

100. *To make “verde alommo.”*—Take the scum of woad, and

¹ See No. 105.

Et se te piace tu poi torre in loco del zafferamj quella terra gialla tenta cum lo sugo de spino gerbino et vira verde o vero cum lo sugo de spino gerbino.

97. *A fare aqua verde da dipengiare in panno.*—Havve fagioli maturi e metili in uno sachetto de canavaccio bene forte et mitilo a strigere et tranj lo licore mitilo a bulire et lassalo disimare per mita poi li pone uno poco di polve de alumi de rocho e toto dal foco et sera bona et bella tenta.

98. *Affare verde azurro naturali.*—Tolli azurro de qualunque sorte voi bene subtili et metilo amollare in aqua dolce poi tolli de lo verde ramo fino et macinalo cum aqua dolce ben subtili poi lo metti tanto zaffarami che diventa verde scuro poi lo pone in uno cornetto de vetrio et mistalo bene poi lo lassa reposare sicche vada bene al fondo la quale aqua te remara disopra alo verderamo chiara collarita in verde la quale aqua verde se vole separare da lo dicto verderamo cautamente poi tolli el tuo azurro mollificato et sepera via quella aqua quanto piu poi et de po tolli la dita aqua verde e gietala sopra a lo azurro et incorpora bene luno cum laltro remenandolo bene cum lo deto et haverai verde azurro perfecto et mantira lo colore et quando fosse secco e tu lo volesci operare gietali de la sopraditta aqua verde et molifica lo verde azurro cum lo deto e se fusse debili distemperalo cum gentili gomma et sera perfetissimo verde azurro.

99. *A fare verde bono.*—Tolli li acini del pero citrino maturi al tempo de (sic) e tranj lo sugo poi tolli altrettanto vino bianco et mistica insiemj et fa bulire per mita po tolli alumj de rocho in polvere el tuo parer e gietalo suso quando bolle e misticalo uno poco poi lo leva dal foco et pollo afredare et commo e reposato e fredato et tu lo cola et serbalo in uno vaso de vetrio et usalo a dipengiare.

100. *Affare verde allommo.*—Tolli la fiorata del guato e seccala

dry it until it becomes a powder, and temper it with gum water and a little roche alum, and it will make a good green.

101. *To make green.*—Take verdigris, and grind it very fine with strong vinegar, and put it on a new brick which has a hollow in the middle; let it stand until the moisture and the vinegar are removed, that is, until the brick has soaked up the moisture. Do this four or five times, and each time soak the verdigris with fresh and very strong vinegar; and this is called purifying the verdigris. This purification is also done with ley made from ashes in the manner before-mentioned. Then take the purified verdigris and mix it with a little white lead or a little orpiment, and distemper it with gum-water, and it will become a fine and good green.¹

102. *To make green.*—Put the ripe seeds of the buckthorn into a boiler with an equal quantity by weight of strong white vinegar, and boil it down to one-half; afterwards strain it through a piece of linen cloth into a glazed vase, and when you wish to use it, take some of it, and use it as you please.

103. *To make green.*—Take as much as you like of strong white vinegar, and add to it some verdigris reduced to a fine powder, a little powdered roche alum, a little saffron, a small quantity of the juice of rue, and a little powdered gum arabic. Let it all stand in the vinegar for 5 days, then mix a little ceruse with it, and it will become of a fine green colour.

104. *To make a light green for miniature—proved.*—Take violets in the month of March, pound them well, and squeeze the juice into a glazed saucer; put in a little well ground roche alum, and mix it up; afterwards take some pieces of very white linen cloth, not too thick, and dip them into the saucer three or four times, and the oftener the better, and each time dry them in the shade, and when you wish to use the colour distemper it with gum water.

¹ This appears to be purified, or, as it is sometimes called, Distilled Verdigris, the Verd' Eterno of the Venetians.

in polve poi la stempera cum aqua gomata e cum uno pocho dalumj de rocho et sera bono verde.

101. *Affare verde.*—Ahavve verderamo et macinalo cum forte aceto multo subtili tolli el ditto verderamo cum lo aceto macinato et mectilo in uno matone novo el quale habia una concava in mezo et lassalo stare tanto che la humidita et lo aceto sia andata via cioe che lo matone habia bevuto quella humidita et cosi continua 4 o 5 volte et omne volta reintride el dito verderamo cum novo aceto fortissimo et questa se chiama la purgatione de lo verderamo et anco se fa la dita depurgatione cum lo ranno facto de cenere recotta il modo desopra poi tolli de lo dicto verderamo depurgato mistalo cum uno poco de biaccha o vero uno poco de oropiumento et distemperalo cum aqua gummata et vira bello verde e bono.

102. *A fare verde.*—Recipe semina spini cervini matura et micta eas in caldario et tantumdem aceti forti et albi scilicet quantum est pondus semina predictorum et fac devenire usque ad medium postea cola cum pezia pannj lini et eum pone in vitriato vase et cum vis operare tolle de ipso et utere ad beneplacitum tuum.

103. *Ad viridem faciendum.*—Summe aceti albi forti quantum vis et in eo pone viridem ramum in pulverem subtilis reductam et aliquantulum pulvis aluminis rochi et modicum zafferami et modicum succi ruuite et aliquantulum pulvis gumme arabici et in aceto permite stare per 5 dies et deinde misce cum eo aliquantulum ceruse et efficitur color magis viridis.

104. *Affare verde chiaro per minio provato.*—Recipe de mense Martij violarum et pista bene et exthrae succum in una scutella vitriata et impone aliquantulum aluminis rocci optime triti et misce simul postea recipe pezias panni lini albissimi et non nimis subtiles et infunde eas in dicta scutella ter vel quatuor et tanto plus tanto melius et pro qualibet vice sicca eas ad humbram et cum vis eas operare stempera aqua gumata.

105. *To make a splendid yellow, finer than orpiment or German giallolino.*—Take berries of buckthorn, when they are quite ripe, extract the juice from them, and keep it in a glass jar well closed for a fortnight. When you wish to use it, take strong ley, clear and fine, and for each mezzetta¹ of ley take an ounce of roche alum in powder, and make it boil with the ley for the space of one paternoster in a glazed vase; then remove it from the fire and let it cool. Next take for every tumbler of ley with alum one-third of a tumbler of the juice, and incorporate it well with the ley and alum, which will become a sort of dark green water, and let it stand thus incorporated for a night or more. Then take very fine white earth such as the fellmongers use, and incorporate it gradually with the green ley, in a vase, such as a saucer, with your finger, and add to it so much earth that it may be of the consistence of dough; keep mixing it with your finger as long as you can, and set it to dry in the sun; and if you please you can soak it two or three times in the green ley, in order that it may become more beautiful and of a brighter colour. Distemper it with clear ley, and an equal quantity of prepared white of egg, and with powder of gum arabic, and let it remain together for two nights. And if you wish to use the yellow before it dries, that is, when you have just made it, take some of the green ley and mix it with a very little white earth, and paint with it whatever you like, and it will remain a most beautiful yellow. And know that the juice is good all the year, but is nevertheless better stale than fresh. If it becomes hard, mix a little ley with it.

106. *To make a good and natural green—proved.*—Take verdigris and grind it very fine with water; then dry it. Next take some of the before mentioned yellow and mix with the verdigris, that is to say, three parts verdigris, and one of yellow, and it will become a noble and durable green, and you may mix more or less yellow, as you please, because the more yellow you put, the lighter it becomes.

¹ A glazed earthen vessel used to measure wine; it holds the fourth part of a Florentine Fiasco. Alb. Diz.

105. *A fare giallo belitissimo piu che oropiumento o gialolino delamagna.*—Tolli granelli de spingerbino quando sono ben mature et trannj lo sugo et serbalo in una ampolla de vetrio ben turata et lassa cusi stare per 15 di et quando tu lo vorai operare tolli ranno da capo forte chiaro et bello et per omne mezo de ranno tolli una oncia dalumi de rocho in polvere et fallo bollire insiemj cum lo ranno per uno paternostro in uno vaso vitriato poi tolo dal foco et lassa refredare poi tolli per omne bichiero de ranno alumato il terzo duno bichiero de lo dicto sugo et incorpora bene insiemj cum lo dicto ranno alumato che diventarà ad modo duna aqua verde scura et lassa stare cosi incorporato una nocte o piu poi tolli terra bianca ben subtili la quale opera li piliciarj et incorpora cum lo dicto ranno verde a poco a poco in uno vaso commo e una scutella cum lo deto et tanta terra vi meti che vemgna durezza ad modo de pasta et sempre mistica cum lo deto quanto poi et pollo a secare al sole et se te paresse tu poi darli doi o tre bangni cum lo dicto ranno verde acio che vengha piu bello et cum piu vivo collore et distemperalo cum ranno chiaro et altratanta chiara preparata et cum polvere de gomarabica et lassa stare insiemj doi note et cum quello lo distempera. Et se tu lo vorai operare el dicto giallo nante che se secche cioe quando tu lo fai che e fresco tolli de lo ditto ranno verde et mistavi poco poco terra bianca et dallo dove te piace et rimara giallo belitissimo. Et sappi che lo dito sugo e bono tutto lanno e de migliore stantio che fresco e se se indurasse mistali uno poco de ranno acio diventi morbido.

106. *A fare uno bello et naturali verde provato.*—Tolli verderamo et macinalo ben subtili cum aqua poi lo secca poi tolli de lo sopradito giallo et mistica cum lo dito verderamo cioe le tre parte de verderamo et una de giallo et vira nobili verde durabili et poi mistare piu e meno giallo commo te pare perche commo piu giallo vi meti piu chiaro vene.

107. *To make a very dark green—proved.*—Take indigo and grind it very fine; then incorporate it with a little of the before mentioned yellow, and it is done. Distemper it with white of egg or gum water.

108. *To prepare blue-greens, or blues when they are impure.*—Take the blue-green or blue, and put it into a piece of linen cloth and squeeze it, and wash it in a saucer of fresh and clear water, and when you have washed it well, the colour will sink to the bottom. When it is well settled throw away the water at the top, and then add a little clean white honey and mix it until it froths; then grind it well on porphyry, put it into a glazed vase, and wash it with tepid water until the water comes off clear. Then wash it with clear ley, and afterwards with clear water two or three times, and let it settle well; pour off the water cautiously, and then distemper it with prepared white of egg, or with size made from clippings of leather, and it will do well.

B 109. *To make a green tincture for writing.*—Take 2 lbs. of calcined verdigris, reduce it to fine powder, and distil it in an alembic, and keep the water that comes over and it is good for writing and dyeing thread, &c.

107. *Affare uno verde scurissimo probata.*—Ahvvi indico et macinalo bene sotili poi incorporalo cum uno poco de lo sopraditto giallo ed e facto et distemperalo cum chiaro o aqua gom-mata.

108. *Aconciare verde azurri o azurri quando fussaro groschi.*—Havve lo verde azurro o azurro et metilo in una peza de panno de lino stretto e lavalò in una scutella daqua frescha et chiara et commo lai bene lavato lo colore andara al fondo et quando sera bene reposato gieta via laqua de sopra poi li mecte uno poco de mele bianco et netto et mistica bene per infino atanto che fara una schiuma poi lo macina in porfido molto bene poi lo pone in uno vaso vitriato et lavalò cum aqua tepida tanto che laqua nescha chiara poi lo lava cum liscia tepida poi cum laqua frescha doi o 3 volte poi lassalo bene repossare se-para via quella aqua cautamente poi lo distempera cum chiara dova preparata o cum colla de branche de ritalglie de corami et stara bene.

B 109. *A fare tentura verde da scrivere.*—Recipe lb. doi de verderamo abrusciato et fanne polvere subtili et polla a distil-lare a lambico et serva laqua e de bona da scrivere et da teg-nare filo etc.

HERE BEGINS THE HEADING OF THE FIFTH
CHAPTER

ON THE MAKING OF LAKES, PURPLES, AND VERZINO IN
VARIOUS MANNERS, AND FIRSTLY,

110. *To make good and fine lake.*—Take 1 lb. of clippings of Rosato,¹ and put them into very strong ley made of ashes, such as the dyers use, in a new glazed jar, and set it on the fire to boil, and boil it slowly for the space of two *paternosters*, then pass the ley and the shavings through a clean linen strainer, and press it strongly with the hand so that all the ley may pass out; then put back the ley to boil again without the clippings, and when it is boiled, throw it on the shavings which are in the strainer, and press the strainer hard with the hand so that all the ley may run out, and put it by. Throw away the shavings and wash the strainer well, so that there may not remain in it any hairs of the shavings. Next take 5 oz. of roche alum in fine powder, and put it a little at a time into the ley, until the ley begins to settle, which you may know by its turning almost entirely to a thick scum, from top to bottom, and you must keep on mixing the ley with a clean spoon until it becomes cool and settles; then put the ley into the clean strainer and strain it all off, and the lake will remain on the strainer. Let it remain on the strainer until quite dry, and then put it into a small basin of glazed earth full of clear and cold water, and stir it and rub it up well with the hand until it diffuses itself; all the scum which rises to the top at first must be thrown away with a feather; then wash the strainer well and pour into it the water in which you have put the lake, and the clear water will pass out along with the alum, and this is called purifying it

¹ Rosato is a kind of woollen stuff dyed with "grana," that is Kermes.

INCIPIT DISTINCTIO QUINTI CAPITULI

DE LACCIS ET PAVONATHIS FIENDIS IN DIVERSIS MODIS ET
VERZINIS. ET PRIMO, VIZ.

110. *Affare laccha bona et bella.*—Tolli lb j de cimatura de grana de rosato e mectila in ranno fortissimo facto de cenere la quale usa li tentori in una pignatta vitriata nova et polla al foco a bullire et bolla pianamente per spatio de doi pater nostri poi mecti el ranno et la cimatura per uno collatoro netto de panno de lino et premilo forte cum mano siche tutto el ranno escha fora et poi repone el dicto ranno a bullire de novo senza ala cimatura et bolito el gietta sopra ala cimatura che e in lo collatoro et preme forte el colatoro cum mano siche tutto el ranno escha fora bene et ripollo da parte et la cimatura gietta via et lava molto bene il colatoro siche non vi rimanga veruno pelo de la ditta cimatura poi tolli once cinque dalumi de rocho spolverizato subtili et metilo a poco a poco per volta in el dito ranno per infino che el ranno se strenghe che lo conoscirai quando el dito ranno tutto quasi se converti in una schiuma grassa in fino al fondo et mai se vole finire de mistare el dicto ranno cum uno cochiaro netto per infino che se fredda bene e che se strenga poi meti el ditto ranno stretto in lo dito collatoro lavato et cola tucto lo ranno et la lacha remara de dentro et lassala tanto stare in lo ditto collatoro che ella se seche bene poi la pone in una catinella de terra vitriata piena daqua fredda et chiara et rimenala et sfregala bene cum le mano tanto che se diffaccia et tutta quella schiuma che vene a summo da principio se vole giettare via cum una penna et lava bene lo colatoro et ripone suso questa aqua ove hai stemperato

from the alum. And when the lake is nearly dry, remove it from the strainer, and spread it out with a broad knife on a new tile, let it dry in the shade, and before it has done drying, cut it into pieces according to your fancy, and let it dry, and it is done. And know that the more it is purified from the alum, the more beautiful and lively, and the better it is. And observe this secret, that if you wish the lake to have a brighter colour and one which will never change, when the shavings are boiling, add a lump of assafetida¹ as large as a chesnut.

111. *To make lake in another manner.*—Take baked ashes, such as the dyers use, and make a caustic ley, and keep it clean and clear; then put the ley to boil in a glazed jar, and when it boils, put a lump of quicklime, not slaked, into it, and strain it through a close cloth. Then take 2 “petitti” of this ley clean and fine, and put it into a new glazed pipkin and add to it half a pound of shavings of cloth, mixing it well; then put the ley over a clear fire, and make it boil until reduced to one-third. When it is so reduced, add to it 3 oz. of roche alum, and make it boil until it is reduced one-third; then strain it through a straining cloth into a glazed vase, and put the lake on a new brick that has a hollow in the middle, a little at a time if the brick will not hold it all at once, and let it remain for the space of 5 hours; then take it out and do this as long as any lake remains. Then put it into a basin to finish drying in the heat of the sun, and when it is nearly dry, spread it on a very smooth table, and when quite dry, cut it into pieces according to your pleasure.

¹ The virtue of this gum resin probably lay in the bitter or extractive principle, for it is known that lakes are more durable if the water used in making them be previously boiled with some astringent bark, such as the bark of the beech, or the small branches of the poplar. (See *Traité de la Peinture au Pastel, du secret d'en composer les couleurs, avec indications d'un grand nombre de nouvelles substances propres à la Peinture à l'huile, et le moyen de prévenir l'altération des couleurs.* Par M. P. R. de C. C. à P. de L. Paris, 1788.) The permanence of the colour of the Kermes is thought to be owing to the astringent matter it contains.

la lacha et laqua chiara uscira fuori insiemi cum lo alumi et questa se chiama la purgatione de lo alumj et quando la dicta lacha sera quasi sciuta et tu latra del dicto colatoro et cum uno coltello largo la spiana in una tegola nova et lassalo secare alombra et nante che se fornischa de secare fanni li pezi a tuo modo et lassa secare e de facta. Et sappi che quando se fa quella purgationi de lo allumj tanto e piu bella piu viva et meglio. Et nota questo secreto che se tu voli che la lacha habbia piu vivo collore et mai non perda quando la dicta cimatura bolle metice tanta assa fetida quanto una castagna et stara bene.

111. *Affare lacha per altro modo.*—Recipe cenere ricolta et fa capitello et fanne ranno la quale cenere usa li tentore et serbalo necto et chiaro et poi pone a bullire el dicto ranno in una pignatta vitriata et quando el ditto ranno bolle metice una zuppa de calcina viva che non sia disolta poi la cola cum uno panno stretto et colgli lo ranno netto et bello poi tolli doi pezzetti de de questo ranno et metilo in una pignatta nova vitriata et metice meza libra de cimatura de grana mistando molto bene poi la pone al fuoco chiaro et falla bollire tanto che le tre parte revengna luna et quando e reentrata per terzo et tu ce pone tre once dalumi de rocho poi lo fa bullire tanto che a rentre per terzo poi la cola per uno telo de staccia in uno vaso vitriato poi la pone in uno matone novo el quale habia uno concavo in lo mezo et metice la dicta lacca a poco a poco se non ce po capire tucta e lassala stare per spatio de 5 hore et poi la cava et cosi farai per infino che tu nai poi la pone in una lavella a fornire de secare al sole bene caldo et quando e per secarse stendila in suso una tavola bene polita et quando e bene secca fannj li pezi al tuo piacere.

That Assafœtida was used occasionally by painters, is proved by a Document, dated 1347, which was discovered by Professor Ciampi, in the Archives of S. Jacopo di Pistoia. Professor Branchi, of Pisa, to whom the document was submitted, together with fragments of paintings from S. Jacopo, which he analyzed, could form no opinion as to its probable use, which appears to be explained by the text. See "Lettera dal Prof. Branchi al Sig. Sebno Ciampi sopra gl' ingredienti di varj mosaici e di varie antiche pitture."

112. *To make lake in another way.*—Take quicklime, and put it into a vase to boil, with sufficient water to cover the lime two fingers deep, and mix it well with a stick. Let it boil for the space of 3 Ave Marias; then suffer it to cool for a night, and afterwards filter the liquor which stood on the lime. Put the verzino scraped fine into this water, by which it should be covered; then take fine flour, or starch in powder, and put it into the water with the verzino, and mix it well together. Let it remain so for a night, then separate the water carefully, and make the starch or flour into a ball as if it was dough, and put it to dry in the oven after the bread is taken out, or even later, in order that it may not burn, and let it dry well. Then knead it again with the water of the verzino, and let it rest. Throw away the water, and make the paste into little balls like hazelnuts, and put them to dry in the shade where no dust or other dirt can get to them, and the lake will be made. And if you wish the lake to have a bright and perfect colour, take shavings of rosato and put them to boil in the lime-water, and let them boil until reduced one-half; then strain the liquor and put the verzino to soak in the water, and follow the recipe as before.

113. *To make verzino good for painting flowers on miniatures.*—Take a piece of lime, reduce it to powder, and put it into white of egg, and stir it well with a stick, in the same manner as the white of egg is prepared for vermilion; let it settle, and then separate the scum and filter off the white of egg. Then take verzino scraped fine with glass or with a rasp, and put it into the filtered white of egg, and let it soak for two days, and there must be enough white of egg to cover the verzino and it is done.

114. *For the same, another way.*—Take quicklime and put it to soak in a vase with sufficient water to cover the lime three fingers deep, stir it well with a stick until you see that it is well slaked; then let it settle for two days, and take the clear water and some scrapings of verzino, and put the verzino to soak in the water for the space of three days. Then put the

112. *Affare laccha per altra via.*—Tolli calcina viva et metila in uno vaso a bullire cum tanta aqua che sopra avantia a la calcina doi deta et mistila bene cum uno bastone et bolla per spatio de 3 ave marie poi lassa fredare per una notte poi destilla per filtro la dicta aqua che e sopra a la calcina et in questa aqua pone el verzino raso subtilmente et fa che lo verzino stia coperto da la dicta aqua poi tolli fiore de farina o vero amido in polvere et metilo in la dicta aqua dove e el verzino e mistica molto bene insiemj e lassa cusi stare per una nocte poi sepera la dicta aqua cautamente ed e quello amido o vero fiore de farina ne fa una pallotta commo se fusse pasta et polla a secare in lo forno quando e tratto el pane o piu tardo che non se abruscia et lassala bene secare poi la reintride cum la sopra dicta aqua del verzino poi la lassa riposare e gietta via quella aqua e de la pasta ne fa pallotecti ad modo de avellane et polla a sciugare alombra dove non vi vada polvere ne altra brutura e de facta. Et se tu volesci fare che la dicta laccha habbia vivo et perfecto collore tolli cimatura de rosato et polla a bollire in la sopra dicta aqua de calcina et tanto bolla che arentre per mita poi la cola et in la dicta aqua pone a molle el verzino et seguita la recieta al modo de sopra.

113. *Affare verzino da fiorire minij bono.*—Recipe calcina impetra et fanne polve et metila in chiara dova et rimenela bene cum uno bastone commo se concia lachiara per lo cinabrio et lassa possare poi sepera via la sciuma et distilla quella chiara per filtro poi tolli del verzino raso subtili cum vetroio overo cum la raspa et metilo de dentro in la dicta chiara stillata et lassalo stare a molli doi di e vole esser tanto chiara che lo verzino stia coperto e de fatto.

114. *Ad idem alio modo.*—Ahvve calcina viva et metila a molle in uno vaso cum tanta aqua che sopra avanza ala calcina 3 dete et rimenela cum uno bastone molto bene per infino a tanto che tu veghi che la calcina sia bene disciolta poi la lassa posare per doi di e colglie laqua chiara e bella poi tolli de lo verzino raso et pollo a molle in la dicta aqua per spatio de 3 di,

whole on the fire and boil it down to one-half or less; then add some pounded alum and a little gum arabic, take it off the fire, and let it settle; when cool strain it through a piece of linen cloth and it will be fine verzino.

115. *To make verzino, another way.*—Take verzino, scrape it fine, and put it into a glazed vase to soak with a sufficient quantity of cold and purified urine to cover the verzino; then add 2 parts of alum zucharino, one of white-lead, and a little pounded gum. Let the whole stand to soak for two days, then strain it through a linen cloth, and put it to dry; afterwards distemper it with gum water, and it will be good verzino.

116. *To make verzino and to preserve it in powder.*—Take verzino, scrape it fine, put it into a cup, and pour upon it a quantity of prepared white of egg sufficient to cover the verzino, add a little roche alum so as not to make it froth; then add a drop or two of honey, and let it stand for one natural day. On the second day, add a little whipped white of egg, and scrape into it some of the before mentioned alum, as you did before, so that it may not froth, and do this for three or four days; afterwards strain it through a clean piece of linen, put it into a shell and let it dry in the sun; then scrape it out of the shell and preserve the powder. When you wish to use it, put the powder into a shell with some ley in it, to soften, and do as you please with it.

117. *To make pavonazzo with the juice of herbs.*—Take thick pieces of linen cloth, not new and white, but such as pieces of old towelling and sheeting; then take roche alum and dissolve it in boiling water and then let it cool. Soak the rags in this water, wet them well, and dry them in the shade; then take the juice of a plant which is called “gilosia,”¹ and wet the linen rags many times in this juice, and between each time let them dry well in the shade. Keep them in a place open to the air, such as a saucer; and when you wish to use the colour take a little of that linen, and put it to soak in a shell with gum water,

¹ Erba Gilosia. The *Amaranthus Tricolor*.

poi lo pone al foco a bollire per la mita o mancho poi li pone uno poco di alumi pisto et uno poco de commarabico et tolo dal foco e lassa possare poi lo cola quando sera freddo cum una peza de panno de lino et sera bello verzino.

115. *Affare verzino per altra via.*—Havve verzino et radilo subtilmente et metilo in uno vaso vitriato a mollo cum tanta orina fredda et porificata da le fecce che copra el verzino poi ce poni alumj zucharino parte 2 et per terza parte biacha et uno poco de gomma pista et lassa stare a mollo doi di poscia lo cola cum una pezza et pollo a secare poi lo distempera cum aqua gommata et sera fattò bello verzino.

116. *A fare et conservare lo verzino in polvere.*—Summe verzinum et subtile rade et pone in parascide et desuper infundi claram ovi preparatam ita quod coperiatur verzinum et impone desuper aliquantulum de lumine rochi ita quod non facia spumam et deinde mite unam aut binam guttam mellis et permite stare per unum diem naturalem. In secunda vero die addas aliquantulum de clara ovi rupta et abra de super de predicto alumine ut prius fecisti ita quod non fatia spumam et sic faties per tres vel quatuor dies—postea cola cum pettia munda panni lini et micte in coculea et dimitte siccari ad solem postea abra de coculea et serva pulverem et cum vis operari mitte de dicta pulvere in coculea cum lexivio ad mollificandum et fac velle tuum.

117. *A fare pavonazzo cum sugo dehrbe* (sic).—Accipe peze de panno de lino grosse et non siano nove bianche commo e peze de tovalglie et peze de coltrice use poi tolli alumj de rocho et disfallo in laqua bolita poi lassa fredare et in quella aqua aluma le peze et bagnale molto bene poi le sciuga alombra poi tolli lo sugo duna herba che se chiama gilosia et in quello sugo bagna le peze piu e piu volte et da una volta et laltra lassale sciugare alombra bene et conservale in loco che le dia hayere commo e una una scatella et quando la vorai operare tolli uno poco de quella peza et metila a mollo in una coccia cum aqua

and let it stand for the space of an hour ; then press it out and paint with it.

118. *To make the colour brasilium.*—Take verzino or brasili-um, scrape it and put it into sufficient gum water to cover the verzino, in a glazed vase for a day and a night, and then boil it until the third part is consumed ; then add some roche alum to it and boil it a little, and then pour into it one-third part of strong white vinegar, and let it boil a short time, afterwards strain it and keep it excluded from the air.

119. *To make verzino another way.*—Take scraped verzino, steep it in prepared white of egg for two days ; afterwards strain it through a piece of white linen drop by drop on a new brick, and let the verzino remain until dry ; then take it off carefully with a knife, and put it away, and when you wish to use it, soften it with water, and write whatever you like.

120. *To make a colour like grana with verzino.*—Take verzino scraped fine, and soak it in ley as strong as you think proper for the space of 3 days ; then let it boil over a slow fire in a glazed vessel until the fourth part of it is consumed ; then add to it immediately a little alum zucarino, and a little roche alum in powder, and mix it well with a stick ; then let it cool, pass it through a filter, wrap it up closely, and put it away, and you will have a good colour like grana.

121. *To make verzino over the fire.*—Take half an ounce of verzino scraped fine, and a sufficient quantity of white wine to cover the verzino ; then put these ingredients into a new glazed pipkin, and let them soak for the space of one natural day. Then add to them one-eighth part of roche alum, and the same quantity of gum arabic in powder, and let the whole stand another day. Boil until the liquor is reduced one-half, let it cool, then strain it through a piece of linen, and keep it in a well closed glass bottle, and it will be good.

122. *To make good verzino, proved excellent.*—Take verzino collombino¹ scraped fine, and put it to soak in very strong and

¹ Verzino Collombino. Marco Polo, the Venetian traveller, says, the best Brazil wood, or, as he calls it, Verzino, grew in the Isle of Ceylon.

gomata et lassa stare per spatio de una hora poi la spremj et con quella depengie.

118. *Ad faciendum collorem brasilium.*—Recipe verzinum sive brasilium et rade et pone in aqua gummata ita quod cooperiat verzinum in vase vitreato per diem et noctem postea pone ad bulliendum donec terzia pars consumetur postea pone intus de alumine roccj et bulliat parum postea pone de forti aceto albo quantum fuerit tertia pars aque et bulliat parum postea cola et serva bene turatam.

119. *Ad faciendum verzinum per aliam formam.*—Abeas verzinum rasum et mitte in clara ovj preparata per duos dies postea cola eam cum pezia panni lini gutatim super matonem novum et fac manere donec siccatur postea cum curtello elleva diligenter et repone et cum vis eum operare mollifica cum aqua et scribe quicquid vis.

120. *Affare colore de grana cum verzino.*—Tolli verzino raso subtilj et metilo a mollo in ranno da capo forte bene quanto te paia che stia bastevole per spazio de 3 di poi lo fa bullire al fuoco lento in uno pignatto vitriato per infino a tanto che sia consumpta la quarta parte poi poni subito uno poco dalumj zucarinio et uno pocho dalumj de rocho spolverizzato poi lo mistica cum uno bastone bene et poi lo lassa fredare et poi lo stilla per filtro et ripollo bene turato et haverai bono colore de grana.

121. *Affare el verzino al fuoco.*—Tolli meza oncia de verzino raso subtile poi tolli tanto vino bianco quanto copra el dicto verzino poi lo pone in uno pignatello vitriato novo et lassalo mollare per spatio de uno di naturali poi tolli una otava dalumj de rocho et altratanto gommarabico spolverizzato poi lo pone in lo dicto pignatello dal verzino et lassalo stare uno altro di poi lo pone a bullire al foco et quando sera aretrato permita poi lo lassa fredare poi lo cola cum una peccia de panno di lino et serbalo in ampolla de vetro bene turata et sera bono.

122. *Affare verzino bono provato optimo.*—Recipe verzino collombino subtilmente raso et metilo a mollj in ranno da capo

Depping supposes the term "Verzino Collombino" was derived from Colombo, a city of Ceylon. See Depping, *Histoire du Commerce entre*

clear ley, and let the ley be 3 fingers deep over the verzino. Let it soak in a glazed pipkin two natural days, and then put in a good pinch of the clippings of cloth dyed with grana, and let them soak well. Then put the liquor over the fire to boil until reduced one-half, add a little roche alum, a little gum arabic in powder, and a little assafœtida, and let it boil slowly for the space of two misereres, so that it may not boil over, as it makes much froth; let it cool, and strain it through a piece of linen, and keep it in a well closed flask.

123. *To make verzino in the sun.*—Take the verzino, scrape it fine, and then put it into a large fish shell, or in a glass vase, with sufficient red wine to cover the verzino; let it soak for a day and a night in the shade, not exposed to the night air; put it in the heat of the sun, and let it stand for 3 or 4 hours; and take roche alum and a little gum, pound them both fine, and add them to the verzino; and let the verzino stand in the sun for 3 or 4 days, but do not expose it to the night air. Then strain it, and keep it in a well closed jar, in order that it may not change its colour, and it will be good.

124. *To make verzino in another way.*—Take verzino, and scrape it with glass, and then put the rasped wood into a shell half full of water, and let it stand for a day and a night; and having done this, strain it through a cloth, and press it into another saucer, and put into it a piece of alumen scabis,¹ the size of a bean, and afterwards set the lake in the sun, and let it dry, and preserve it. When you wish to use it take a little drain water, and distemper it with that water, and use it.

125. *To make a pavonazzo colour.*—Take blue flowers which grow in the corn when it blooms, and extract the juice, and then do as before directed for the other purple made with the pieces of linen, and it is done.

126. *To make a pavonazzo colour, perfect for painting on walls.*—

le Levant et l'Europe depuis les Croisades jusqu'à la fondation des Colonies d'Amérique, 2 vols. Paris, 1830, p. 146 n. Verzino Colombino is mentioned in the Tariffe of Pisa quoted by Pagnini in the work entitled

fortissimo et chiaro tanto che lo dicto ranno avantia sopra al verzino 3 o 4 deta e lassalo stare a molle in uno pignattino vitriato doi dj naturali poi li mete una bona piccichata de cimatura de grana et fa che se mollifica bene poi lo pone al fuocho a bullire per mita poi tolli uno poco dalumj de roccho et uno poco de gommarabico in polvere et uno poco de assa fetida et lassa bollire per doi miserere pianamente acio non si sparga per la schiuma che fara poi lassalo refredare et colalo cum una pezza et serbalo in ampolla bene turata.

123. *Affare el virzino al sole.*—Tolli el verzino et radilo subtili poi lo pone in una coccia de pessci grande overo vaso de vetro cum tanto vino vermiglio quanto che copra el dicto verzino et lassalo mollificare per uno di et una nocte alombra in loco che non li dia lo sereno poi lo meterai al sole bene caldo et lassalo stare 3 o 4 hore poi tolli alumj de rocho et uno poco de gomma et pista subtile luno et laltro poi lo meti in lo dito verzino poi lassa stare al sole el dicto verzino 3 o 4 di ma la nocte fa che non stia alo sereno poi lo cola et serbalo in una ampolla bene turata acio non se smortisca et sera bono.

124. *A fare verzino alio modo.*—Recipe verzinum et rade cum vitrio et postea tolle cocleam et pone in ipsa cum lingno rupta cujus medietas sit aqua clara et permite per unum diem et unam noctem hoc facto tolle ipsum et cum panno cola et exprime in aliam cocleam et immise tantum alumen scabis quantum est unum ciceris postea pone ad solem et permicte scicari deinde serva et cum volueris operari tolle aliquantulum aque chloche et distemperabis cum ea aqua et opera.

125. *Ad faciendum colorem pavonatum.*—Tolli fiori torchi i quali nascano in lo grano quando spiga et tranni lo sugo poi fa a modo di sopra in laltro pavonazzo cum le peze et de fatto.

126. *Affare collore pavonazzo perfetto per operare in muro.*—

“Della decima e delle altre gravezze del commune di Firenze,” &c. Lisbon e Lucca, 1765-66.

¹ Query Alumen Scagliuolo?

Take yellow ochre, clean from all other mixtures, and put it into a vessel which will stand the fire, and set the vase with the ochre to bake in a brick or glass furnace; and know, that if you put it at the top of the furnace it will become of a red colour like vermilion. And if you put the vase at the bottom of the furnace in a place where it will have more heat, it will become of a fine pavonazzo colour, and you must let the vase remain in the furnace from the time that the fire is first lighted, until the furnace is emptied, when it will be done.

127. *To make a very durable and beautiful verzino.*—Take calcined tartar and make as clear a ley with it as you can; and if you make the ley with white wine, it is better than making it with plain water, but either will do. Then take verzino scraped very fine, as much as you like, and put it to soak in the ley so that the verzino may be just covered by the ley, and no more, and let it remain so for a day and a night. Then put it into a glazed jar, and let it boil down one-third, that is to say, let it be reduced by one-third; then add gum arabic in fine powder, as much as you think will suffice, and let it boil a very little. Add a little roche alum, in fine powder, and immediately take it off the fire and let it cool and settle; then strain it through a linen cloth, and keep it in a well-closed phial, and throw away the lees.

128. *To make a light and brilliant pavonazzo for using on paper, that is to say, for boxes, and on parchments.*—First give the parchment or boxes, or other similar things, a coat of vermilion distempered with gum water, and let it dry; then take scraped verzino and put it to soak in white of egg well broken and beaten up, clear and without froth, that the verzino may be covered with the white of egg, and let it stand for two natural days. Then separate the verzino from the white of egg, and with that coloured white of egg, give 3 or 4 coats over the vermilion, each time letting it dry in the shade, and you will have a bright and beautiful pavonazzo; and know that you must not put any gesso whatever upon the parchment, but only give a coat of vermilion on the bare paper, just as it is, because if

Havve terra gialla et ben necta da altre misture et ponila in uno vaso bistugio o altro vaso che arestia a foco et mettilo dicto vaso cum la dicta terra a cociare in fornace de matone o vetrio e sappi che se tu lo metti desopra a la fornace vira uno collore commo cinabrio rosso e se tu metti lo dicto vaso in fundo de la fornace in loco che habia piu caldo vira uno collore pavonazo e bello. E volse lassare stare el dicto vaso in la fornace da principio quando se accende foco per infino che se sforna la dicta cocta.

127. *Affare verzino bellitissimo et durabili.*—Tolli cenere de feccia et fanne liscia bene chiara quanto tu poi e se tu farai la dicta liscia cum vino bianco e meglio che a farla cum laqua cummuna ma omne una e buona poi tolli verzino bene raso subtili la quantita che voli e pollo a mollo in la dicta liscia per modo che lo verzino stia coperto da la liscia et non piu et lassa cuscì stare per di uno et una nocte poi lo pone al foco in uno pignatino vitriato et lassalo bollire per terzo cioe che arentre la terza parte poi li pone tanto gommarabico bene pisto quanto te paia che sia bastevili et lassalo bollire uno poco poco poi ce pone uno poco de alumj de rocho bene subtili et subito lo leva dal foco et lassalo refredare et reposare poi lo cola cum panno de lino et serballo in una ampolla bene turata et le fecce gietta via.

128. *Affare pavonazzo chiaro et lucido per operare in carta cioe fare scatole et pargamene.*—Prima campeggia le pergamene o scatole o altre cose simili de cinabrio cum aqua gommata distemperato et lassa sciugare poi tolli verzino raso et pollo a mollo in chiara dova bene fratta o dibatuta et chiara senza schiuma tanto che lo verzino sia coperto da la dicta chiara et lassa stare per doi di naturali poi sepera lo verzino da la chiara et de quella chiara collorita darai 3 o 4 mane sopra a lo lecto de lo cinabrio et omne volta lassa sciutare alombria et haveraj pavonazo chiaro et laudabili et sappi che ale dicte parchamene non se li vole dare giesso de niente de fora ma solo dare lo cinabrio in carta schietta commo sta perche se tu li daessi lo gesso lo verzino lo faria crepare per

you were to put gesso on it, the verzino would make it crack on account of the white of egg. And upon the pavonazzo colour, you can make flowers with other colours and paint just as you like; and this is a tried recipe.

129. *To make good lake.*—Take of urine as much as you like, and put it into a vase for the space of a week; then pour it into a pipkin and make it boil until no more scum arises. Then make it into a ley with strong ashes. Next take raw gum lac and pound it as small as panic, put it into a new glazed pipkin, and add to it some of the ley of urine, which must be quite clear, and mix it well with a stick; let the urine or ley be warm when it is poured upon the gum, and when it is well mixed, pour off gently the ley so coloured, and put it into a glazed jar. Then take roche alum in fine powder and mix it with water; then put some of this alum water into the shell containing the ley coloured with the lac, and when you see that it begins to froth, do not put any more. Then put that which has coagulated into a piece of linen like a strainer, hang it up high, and let the water run off; then take the drainings and put them back into the pipkin where the gum was still left, and mix it up well. Then pour it out, and repeat this another time, thus making 3 sorts of lake; the first best; the second not so good; and the third worst. And know that the ley must be very strong, made with urine, and baked ashes, and it must be poured very hot upon the powdered gum, putting the gum on a strainer or filter of linen; then pour the hot ley several times upon it; afterwards add the alum, and dry it; and also dry by itself what remains in the strainer, and it is done.

130. *To make lake as before in another manner.*—Take of gum lac 5 lbs., reduce it to powder and sift it through a close sieve; then take filtered urine, which has stood for 20 days, and place a small kettle on the fire, into which put the urine, and when you see the scum which floats upon the urine, remove it with a perforated ladle, and when the urine is well skimmed and warm, add 3 oz. of roche alum in powder, and

amore de la chiara et sopra el dicto pavonazo poi fiorire cum li altre collore e dipengiare commo a te pare e piace e de probata.

129. *Affare lacha bona.*—Accipe orina d'homo quella quantita che voj et mectila in uno vaso per spatio de 8 dj poi la pone in una pignatta e falla tanto bollire che non faccia piu schiuma poi ne fa lixia cum cenere forte poi tolli gomma de lacca cruda et pistala minuto commo panico poi la pone in uno pignatto novo vitriato poi vi pone de la dicta liscia de hurina che sia bene chiara et necta et miscola bene cum uno bastone et fa che la hurina o vero la dicta liscia sia calda quando la pone sopra ala gomma et commo e bene mista poi ne cava fora quella liscia pianamente cosi collorato et metila in una concha vitriata poi tolli allumj de rocho bene subtili et stemperalo cum aqua poi de questa aqua alumata ne pone in questa concha dove e la liscia gomata e collorita et quando tu vede che se comincia a pigliare non vene mectare piu poi tolli quella che e arapresa et mectila in una pezza a modo de uno colatoro et apicala ad alto et lassala scolare poi tolli quella scolatura et rimectila in su la pintola dove arimase la gomma et mista bene poi nella cava et fa commo facesti prima poi reitera una altra volta et cosi ne fa de tre sorte la prima e migliore la seconda meno la terza mancho. Et sappi che la liscia vole esser fortissima facta de hurina et de cenere recocta et mecterla sopra ala gomma pista bene calda et mecti la gomma in una torcefecio o colatoro de panno de lino poi ve mecti suso lo ranno bene caldo piu volte poi la luma et secala et quello che te rimane nel colatoro ancho secalo daparte et e facto.

130. *Affare laccha ut supra per altro modo.*—Summe gummam lacce libras 5 et eam pista et cribella cum spisso cribello et demum habeas orinam humanam pausatam per xx dies et stillatam per filtrum et habeas unum caldareum parvum et pone ad ignem cum supra dicta hurina et quando videbis spumam habeas capitem foratam i. e. miscolam perforatam et cum ea proice spumam que supernatat urinam et quando urina erit

make it boil again, and then again while it is still boiling take off the scum with the ladle, and when it is well skimmed and clear, take gum lac, sifted, and put it into the urine and alum, continually mixing it over a slow fire for the space of 3 miserereres. Then take it off the fire and put it into a clean wooden vase, and afterwards take 6 ounces of verzino in very fine powder, either rasped or pounded in a bronze mortar, and put it over the fire in a small glazed jar with a little water, and make the said verzino boil; afterwards strain it into a vase through a thin and close woollen cloth, and let it cool for one natural day; then take the urine with the alum which is in the before mentioned wooden bowl, and put into it this water which has been boiled with the verzino and then strain and mix it well together. Afterwards take 2 lbs. of roche alum, and put it into two metadelle¹ of clear water, boil it, and afterwards put the alum water into the urine, and mix it well and let it settle for a day; strain it through a strainer and let it settle for another day. Then let it dry, and when nearly dry, cut it into pieces as you please, and let it dry hard. And observe, that you may make lake in this way from various stones and of various kinds, namely, from that from which the crimson colour is made, from dragon's blood, from grana, from vermiculis, from minio, from verzino, and from the flowers of herbs.

131. *To make lake by another process.*—Take urine, pour it into a new glazed jar, and put it over the fire, make it boil well, and while it is boiling take off the scum which arises with a stick, and let it boil until one half is consumed. Afterwards put the gum lac into the urine, and let it boil with a small quantity of gum arabic, and a little alum zucharino, or roche alum. When it has boiled for the space of one hour, strain the liquor through a thin linen cloth, and let it settle in a glazed jar, and the lake will sink, that is, will go to the bottom. Then

¹ Metadella, or Mezzetta, a liquid measure still used in Italy.

bene dispumata et calida habeas oncias tres aluminis rochi spulverizati et pone in hurina et iterum fac bullire et denovo bulliendo acipe spumam cum predicto capite et quando erit bene spumata et optime clara acipe gummam lacce setaciatam et pone intus cum hurina alumata semper miscendo ad lentum ignem per spatium trium miserere demum eleva ab igne et pone in uno vase ligneo nitido postea tolle oncias 6 verzini subtilissime spolverizati cum raspa aut pisto in brunzi mortario et pone ad ignem in parva olla vitriata cum modica aqua et fac bullire dictum verzinum postea cola eum in vase per petiam laneam subtilem et spissam et dimicte infrigidari per unum diem naturalem demum acipe urinam alumatam que est in vase ligneo predicto et pone intus hec aqua cocta cum verzino et colata et insimul bene misce postea habeas libras duas aluminis rochi et pone in aqua clara ut sit aqua in quantitate duarum metatellarum et fac bullire insimul postea pone hanc aquam alumatam intus in orina et misce bene et permicte pausare per unum diem demum cola per colatorium et dicmitte pausare per alium diem et dimicte sicari et quando erit apud sicitatem fac de ipsa frusta ad libitum et permicte ad sicitatem duredinem. Et nota quod poteris componere laccha isto modo de pluribus lapidibus et diversis speciebus silicet de quo fit color crimusinus, de sanguine draconis, de grana, de vermiculis, de minio, de verzino, et de floribus herbarum.

131. *A fare laccha per altra forma.*—Recipe urinam humanam et ponas in olla nova vitriata et pone ad ignem et fac bene coqui et dum bullit acipe spumam que facit cum aliquo baculo et tantum bulliat quod medietas consumitur post modum pone intus guma lacce et bulliatur aliquantulum gummi arabici parva quantitate et modico et aluminis zucharinj vel aluminis rocci quo bulito per spatium huius hore fatias hanc materiam colare per pannum lineum radum et permicte pausare in vase vitriato et laccha petit, *i. e.*, ibit ad fundum quo facto proice

pour off the urine which remains upon the lake, taking care not to pour off the lake also, and let the lake dry by itself, and not by the fire, nor in the sun, and it will be good and perfect lake.

B. 132.¹—Take of verzino, scraped with glass or with a rasp, whatever quantity you like. And if you have a drinking-glass full of scrapings, reserve half of the verzino, and put the other half to soak in so much ley as just to cover the verzino; let it soak for the space of one night. Then put it to boil slowly over the fire, and when it has boiled while you can say one ave maria, take some of the verzino which you reserved, and put a small quantity, little by little, upon that which is boiling, and continue to do this as long as you have any left, always waiting a little after each time; and when you have no more left, and the verzino is reduced to one-half, stir in as much roche alum (and it must be well powdered) as you think sufficient, and immediately take it away from the fire and let it rest and cool. Then strain through a thin piece of linen that part only which comes away of itself, without pressing out the dregs. Put it into a well-closed glass phial, and place it in the heat of the sun for a day or two, and it will be fine and perfect verzino for writing. And if you wish the colour to be darker, add to it, when it boils, a piece of quicklime as large as a bean, and it will be done.

B. 133.—Take one ounce of verzino, scraped with a rasp or with glass. Put a third part of the verzino to soak in sufficient spirit of wine to cover it, for the space of one natural day, and add to it the weight of one quattrino of roche alum in powder. Put it over the fire, and let it boil for the space of one pater-noster, strain it, and keep it in a phial, and also put by the verzino. Then take the rest of the verzino, that is, the other two-thirds, and put it to soak in very clear vinegar, and add to it a quattrino or more of alum and a quattrino of gum arabic, and a good half drinking-glass full of vinegar. Let it soak for 8 or 10 days, and then soak in this liquid the verzino which

¹ The rubrics are wanting in this chapter and the next.

urinam que supra lacha erit taliter quod non pritiās lacha postea permite laca sicare non ad ignem neque ad solem per se ipsa et erit bona et perfecta lacha.

B. 132.—Tolli verzino raso cum vetrio o cum la raspa la quantita che tu voli. Et se la raditura fosse pieno uno bichiero tolli la mita de lo dicto verzino et pollo da canto et l'altra mita micti a molle in tanto ranno da capo che lo verzino stia bene coperto dalo dicto ranno et lassa stare a molle per spatio duna nocte poi lo pone a bullire al foco temperatamente et commo ha bulito per una ave maria et tu tolli de quello verzino che reservasti et mettivini supra a quello che bolli a poco a poco et cusi continua per infinj che nai sempre staendo uno poco da una volta alaltra et commo non nai piu et che dicto verzino sia aretrato per mita et tu tolli tanto alumj de rocho quanto te pare bastevij et metivilo dentro et mistalo uno pocho et sia bene spolverizato et subito poi lo leva dal foco et lassalo riposare bene et fredare bene poi lo cola per panno de lino raro solamente quello che nesce da se senza aspremare le fece de niente. Et poi lo pone in una ampolla de vetrio bene obturata et polli al solle bene caldo per uno di o doi et sera bello et perfecto verzino da scrivere. Et se tu lo volesti piu scuro metice quando bollj quanto uno cece de calcina viva et sera facto.

B. 133.—Recipe una oncia de verzino raspato cum la raspa o cum vetrio e tolli el terzo del deto verzino et mectilo a mollo in tanta aqua viti quanto stia bene coperto per spatio de uno di naturali et mectici uno quattrino de alumj de roccho pista et poi lo pone al foco et bolla per uno patrenostro et colalo et serbalo in una ampolla et lo verzino ancora reserba poi tolli el resto de quello verzino quelli altri doi terzi et pollo a mollo in aceto ben chiaro et ponce un quattrino o piu de alumj et uno quatrino de gomma rabico et lo aceto vole essere uno bono mezo bichiero et lassalo stare a molle per octo o dece di et poi ce repone a mollo el verzino che resto dalaqua vite sopra ali altri

was taken out of the spirit, adding it to the other two-thirds, in the sun ; then add to it another quattrino of pounded alum, and let it stand in the sun in a glass vase for 4 or 6 days ; then put it away in a phial, after straining it. When you wish to use the colour, take some of the verzino that was in the spirit, which will be almost yellow, and mix it with one-tenth part of the verzino which was in the vinegar, and write with it, and it will be fine ; and if you wish to have it darker, put more of the verzino made with the spirit into it, and if lighter, less. And the verzino will be better if made in this manner, viz. :—Take the verzino, scraped as before ; then take a tumbler of vinegar, and let it boil for the space of one paternoster, and put into it 2 or 3 quattrini of pounded alum, because when the vinegar is boiling the alum dissolves and liquefies sooner ; and if it does not all dissolve it is of no consequence. Then put the verzino and the gum to soak in it, and place it in the sun for 8 or 10 days, and it will be good, and mix it with the other verzino, steeped in the spirit, and it will be light or dark as was before mentioned.

B. 134. *To make a perfect black.*—Take a small jar of the juice of sumach,¹ and put it to boil until reduced by one-fourth, and add to it a good ladleful of dirt from a grindstone, and reduce it two fingers more, and then add of Roman vitriol in powder 3 oz. and 3 oz. of pounded galls, and when you have added these things make it boil till it is reduced by two fingers' breadth.

B. 135.—Take 1 lb. of “panicella,” and let it boil in a vessel of strong ley until it is reduced four fingers' breadth, and put into it whatever you wish to be yellow ; and if you wish this yellow to be green add a ladleful of the seed of “ghebbi” and a little verdigris pulverized, and strained through a cloth, and put the yellow into it, and it will become green.

B. 136. *To make a perfect colore de grana, such as is worn*

¹ Rhus Cotinus, Cotinus Coriaria, Venus's Sumach, the Venice Sumach.

doi terzi al sole et poi ce aggiungi uno altro quatrino dalumi spolverizzato et lassalo stare al sole in uno vaso de vetro per 4. o sei di et poi lo repone in vostra ampolla collato che de et quando lo vorai adoperare tolli una parte de quello verzino de aqua vite che sera giallo quasi et amistalo et amistalo (*sic*) cum la decima parte de laltro verzino de lo aceto et scrivi cum esso et sera bello et se lo voi piu scuro piu verzino daquaviti ce pone et lo [se ?] lo voi piu chiaro ce ne pone meno. Et se tu farai in questa forma sera mellgljo affare dicto verzino, viz. :—Tolli el verzino raso commo di sopra poi tolli uno bechiero de aceto et bolla per spatio di uno patrenostro et mectice dentro 2 o 3 quattrini de alumj pesta perche bollendo lo aceto lalume se consuma et liquefasse meglio et se non se liquefasse tucta non fa nientj poi ce poni a mollo lo verzino et la gomma et polla al sole per 8 o 10 di et colalo et sera bello et mistalo cum laltro verzino de aquevite che vera chiaro o scuro commo tu hai hauto di sopra.

B. 134. *Affare colore nero perfecto.*—Tolli uno orciolo daqua de scotano et metilo a bollire tanto che calli la quarta parte et mectice una bona scutella de loto de rota et falla calare doi deta et poi ce pone de lo vitriolo romano pisto 3 oncie et 3 oncie de galla pista et quando ce mecti queste cose fa bullire tanto che calli doi deta.

B. 135. Tolli libra una de panicella et mectila a bollire cum uno broco de lisciva forte tanto che calli quattro deta et mecti dentro cio che voi che sia giallo et se tu voli che questo giallo sia verde tolli una scutella de seme de ghebbi et uno poco de verderamo spolverizzato et colalo per panno et mecti dentro quello che fu giallo et sera verde.

B. 136. *A fare perfecto collore de grana cardinalesco cum*

The plant is used in dyeing yellow. From its astringent properties, it is used as a substitute for galls.

*by cardinals,*¹ *with verzino.*—Take a pound of verzino, and rasp it, or cut it across as fine as possible, and put it to boil in half a kettleful of clear rain or river water; reduce the water one half, and before you take the kettle off the fire, add a pound of roche alum, and make the water boil for the space of one paternoster, and it will become red, then remove it from the fire and let it cool until you can keep your hand in it, and pour white vinegar into it. And if you require a colour such as cardinals wear, do not put vinegar to it, but strong ley. And you will have 3 colours if you like to boil what remains at the bottom of the kettle in the strongest ley that you can get; let it be reduced by two-thirds, and it will be a perfect violet.

B. 137. *To make lake.*—Take one ounce of crude lake or grana, put it into a small pipkin, and pour on it sufficient urine or ley to cover the lake, and make it boil on a moderate fire for half an hour without smoke. When it boils keep mixing it, and when it has boiled take $\frac{1}{2}$ oz. of roche alum, and $\frac{1}{2}$ oz. of sal gem,² and grind them well with ley, and put them into the jar before it has done boiling; then take the vessel from the fire immediately and let it cool. Next take a wash-hand basin and a petito of stale urine, or of strong ley, and throw the whole into the basin, and mix it together, and stir it very well with a stick, and put it for 15 days in a place free from dust, stirring it every evening and morning; at the end of a fortnight take a small linen bag and strain it, and put what you have remaining on a new and clean tile, and dry it directly in the shade, and you will have fine lake. Put it back into a box and cut it into pieces, &c.

B. 138. *To make fine lake another way, for miniatures.*—Take clippings of fine “scarlato de grana,” and put them into a glazed jar, and pour upon them sufficient urine to cover the clippings by two fingers’ breadths, and put it, well covered over with a cloth, in a place not exposed to the air, and let it

¹ That this colour was crimson, and not scarlet, is proved by the fact of the verzino assuming a “colore Cardinalesco” when mixed with an alkali, because alkalis have the property of changing vegetable reds to blues;

verzino, etc.—Tolli una libra de virzino et raspalo overo taglialo atraverso minuto quanto se po et mettilo a bollire in aqua pioviana chiara overo aqua de fiume cioe che sia mezo broco et fallo bollire tanto che se sceme per mita et innante che leve la caldara dal fuoco habbi una libra dalumj de roco et fallo bollire per uno patri-nostro et sera virmiglio et levalo dal fuoco et lassalo fredare tanto che tu ce possi tenere la mano et metlice dentro aceto bianco et se tu el voli cardinalesco non ce metcare aceto ma metlice lisia forte et haraj tre colore. Et se voli che quello che romane al fondo de la caldara a bolire ne la piu forte liscia che poi havere et fa che calle le doi parte et sera perfecto violato etc.

B. 137. *Affare laccha.*—Recipe una oncia de laccha cruda overo grana et mettila in uno pignatello et mettivi suso urina dhomo overo ranno tanto che sia coperta la ditta laccha et falla bollire al foco temperato meza hora senza fumi et commo bolle sempre mestala poiche ha cosci bollito tolli meza oncia de alume de marocho et meza oncia de salgemmo et macinali bene cum ranno et mettilo nelo pignatello nanze che romangna de bollire poi lo leva subito dal fuoco et lassalo fredare poi tolli una lavella et uno petito dorina dhomo reposata overo de ranno forte et cacialo suso in la lavella et mistica omne cosa insiemj et remenala molto bene cum uno bastone et polla per 15 dj in loco che non ce vada polvere et remistalo omne sera et omne matina et in capo di xv di have uno sachetino de panno de lino et colalo et quello che romane in lo colatoro pollo suso una tegola nova et bene necta et li la secha de bocto alombra et haverai lacha fina et reponla in una scatola et fanne pezze etc.

B. 138. *Affare laccha per altro modo per minij fina.*—Recipe cimatura de scarlacto de grana fina et mettila in uno vaso vitriato et de sopra ce pone tanta orina domo che la cimatura sia coperta per doi deta de sopra de la orina dhomo et polla bene coperta cum uno panno in loco che non venga aiere et

whereas, if the vinegar had been added instead of a strong ley, the colour would have been scarlet, and not "Cardinalesco."

The purest kind of rock salt.

remain there until the clippings rot, and when they are rotten pour the urine off; then grind the clippings, and when they are perfectly ground cover them up on a piece of very thin linen cloth, and you will have fine lake, &c.

B. 139. *To make lake.*—Take cloth or clippings of [cloth dyed with] grana, but the rosato or scarlet cloth is best, because it has more substance. Put them into ley made from the ashes of bean-stalks, and let the ley be strong. Put the ashes into it and strain it 8 or 10 times, and it will be very strong; then put the cloth into the ley, and the colour will soon be dissolved. Strain it and let it settle; and if you wish to give body to the lake, take roche alum, and mix with the lake, and put it to dry, and it is done. And know that the ashes may be of oak or burnt tartar of wine, &c.

B. 140. *To make lake in another manner.*—Take 1 lb. of gum [lac], and put it into very strong boiling ley, and let it dissolve; then take three glasses of tepid water in which 2 oz. of roche alum have been dissolved, but first put the water into a large shell, throw on it the boiled ley, and let it remain so for 2 days; then take a glass and take also that gum and water and ley, and strain it in a small woollen bag; let it run through and the lake will remain at the bottom.

lassala costi stare tanto che dicta cimatura se immarcisca et sia fragida et quando sera ben fragida scola via quella orina bene et poi macina la cimatura molto bene et quando sera bene macina coprili sopra una pezza de panno de lino bene subtili et averai laca fina etc.

B. 139. *Affare lacha.*—Recipe panno o veramente cimatura de grana ma el rosato o panno de grana e migilore perche ha piu substantia et metti in lesciva de cenere de fava et questa liscia vole esser forte et fa cosci octo o dece volte metcendo dentro la cenere et colala che sera fortissima et in la dicta liscia poni el dicto panno el quale se consumerà presto et poi el cola et lassa possare la colatura et se tu voli dare a lo dicto collore corpo tollj alume di rocho et mistica cum la dicta lacca et polla a secare et e facta et sappi che la cenere se po fare de cenere de cerro overo de fecia de vino etc.

B. 140. *Affare lacha per altro modo.*—Recipe lb. una de gomma laquale porai in liscia fortissima quando che bolle et lassala disfare bene poi habi tre zayne dacqua tepida in la quale sia doi once dalume de rocho ma prima metti laqua in una concola grande et desopra butaraj la liscia bulita et lassa stare cusci doi di poi tolli una zaina et piglia questa gomma et aqua et liscia et polla a collare in una sachecta de tela et lassa uscire fora et la lacha romara al fondo.

HERE BEGINS THE HEADING OF THE SIXTH
CHAPTER—

HOW TO MAKE PURPURINI AND GOLDEN COLOURS; AND HOW
TO LAY ON GROUNDS AND MORDANTS FOR GOLD. AND
FIRST TO MAKE A GOLDEN PURPURINO.

141. *To make purpurino, that is to say a golden colour.*—Take quicksilver and Venetian tin, of each as much as you like; melt them together over the fire, and then let them cool; grind the mass, and then take a glass flask, and lute it with philosopher's lute, and let it dry. Put the powder into it, place the glass in a furnace over a slow fire, and leave open the mouth of the flask; when it ceases to smoke, remove the fire, and when it is cold break the flask, and you will find a splendid purpurino, which you must grind fine upon porphyry. Distemper it with gum water and use it.

142. *To make purpurino another way.*—Take equal quantities of quicksilver and Roman tin, and melt them together, and when cool grind the mass fine; then take sulphur vivum and sal ammoniac, of each equal quantities, that is to say, the same quantity as the quicksilver or tin, and grind all together to a very fine powder; then take a small bottle, and put these ingredients into it, lute the bottle with lutum sapientiæ, and put it into the furnace with a slow charcoal fire; do not close up the mouth of the bottle. When it leaves off smoking, remove it from the fire; and when it is cold, break the bottle and you will find the purpurino.

143. *To make a fine gold colour another way.*—Take beaten tin, sulphur vivum, quicksilver, and sal ammoniac, of each equal quantities; put all into a flask, lute the flask with lutum sapientiæ, and close the mouth of the jar with a cork; then pierce the cork in the middle with an awl, put the jar in

INCIPIT DISTINTIO SEXTI CAPITULI

AD PURPURINOS ET COLORES AUREATOS FATIENDUM. ET AD SCISAS ATQUE MORDENTES AD AURUM PONENDUM. ET PRIMO AT FACIENDUM PURPURINUM AUREUM.

141. *Affare purpurino scilicet colore doro.*—Recipe argento vivo et stagnao vinetiano ana el tuo volere et liquefac ad ingnem insimul et dimite in frigidarj postea macina omnia insimul postea tolle ampullam vitream et luta cam cum luto filosofico et dimite siccarj deinde pone intus dictas res et pone in furnello cum lento ingne et ne os ampulle claudatur et cum deserit futere fumum subtrhae ignem et cum fuerit fridda frange ampulla et invenies purpurinum nobilem quem macina super porfidum subtiliter et stempera cum aqua gummata et utere.

142. *A fare purpurino alio modo.*—Tolli egualmente ariento vivo stamgno romano et fallo strugiare insiemj quando e freddo macinalo bene subtili poi tolli solfo vivo sale armoniaco ana cio e quanto fu l'argento vivo e lo stagno et macina omne cosa bene subtili insiemj poi tolli una bocciecta et mectice dentro le dicte cose poi la inlota cum loto de sapientia et mettila in lo fornello et falli al foco de carbone lento et non obturare la bocca della boccia et quando non fumara piu levali el foco et quando e freddo rompi la boccia et troveraj el purpurino.

143. *A fare collore doro bello per altra via.*—Avve stagno bato solpho vivo argento vivo et sale armoniaco tanto deluno quanto delaltro poi mecti omne cosa in una ampolla et inlotala cum luto de sapientia et serra la bocca della ampulla cum una suvera poi fora la suvera cum una lesina in lo mezo et polla al

the fire and let it remain there moderately heated, till the smoke comes off yellow. Then let it cool, and break the jar, and you will find good purpurino. Distemper it with gum water, and use it for painting miniatures and other things.

144. *To make purpura, in whatever quantity you like.*—Take 1 oz. of sal ammoniac, $1\frac{1}{2}$ oz. of sulphur, 1 oz. of quicksilver, and 1 oz. of tin. Then take a bottle with a very low neck, and lute it with lutum sapientiae up to the neck; then mix the tin and quicksilver together over the fire, grind them with the other things, and put the whole into the bottle, and make a clear charcoal fire under it. When you see the smoke issue from it, continue the fire, and let it remain until you see a silvery line round the bottle; then let it cool, and preserve it, and when you wish to use it, take this porporino, and grind it, and then put it into a vessel with gum water, and it will do; and know that it will bear a great deal of gum water. Lay it upon colours or other miniatures.

145. *To make a gold colour in another manner.*—Take 2 oz. of tin, and mix it with one pound of quicksilver, and when they are well mixed¹ add 2 oz. of sal ammoniac well ground; mix all well together in a glass vase, such as a urinal; put it in the furnace, and give it a moderate fire for a day and a half. Then remove it from the fire, and let it cool, and you will find a fine golden colour, with which you can write. Distemper it with white of egg well beaten.

146. *To make a good and fine gold colour.*—Take a hen's egg, make a small hole in it, take out the white, and leave the yolk in the shell; then fill it with quicksilver, and stop up the hole securely and put it under a sitting hen for the space of 30 natural days, and you will have a golden colour,² which you must distemper with gum water.

147. *To make golden fringes with the paintbrush.*—Take

¹ For the method of mixing the tin with the quicksilver, see No. 168.

foco et falla tanto stare et cociare temperatamente che per lo bugio escha lo fumo giallo allora tolli via lo foco et lassa freddare et rompi lampolla et troverai lo purpurino bello et bono et distemperalo cum aqua gommata et adoperalo a fare minj et altre cose.

144. *A fare purpura secondo la quantita che voi.*—Havvi once j de sale armoniaco, once una et mezo de solpho once j dargento vivo et once j de stagno poi tolli una boccia cum lo collo basso basso et inlotala cum luto de sapientia per infino al collo poi tolli lo stagno et lo argento vivo et incorporalo insiemj al fuoco poi lo matina cum le altre cose sopradicte et metili in nella boccia et polla in lo fornello et falli lo foco de carbone et sia chiaro et quando tu vedi uscire el fumo continua lo foco et lassalo stare per infino che tu vederai uno signo atorno ala boccia ad modo dargento et lassa freddare poi lo conserva et quando lo vorai operare tolli questo porporino et macinalo poi lo pone in la ghiavella cum aqua gomata et lavallo doi o 3 volte cum dicta aqua gomata et stara bene et sappi che porta asa aqua gomata e dalla sopra li collori o altri minii.

145. *A fare collore doro per altra forma.*—Tolli once doi de stangno et metice dentro una libra dargento vivo et commo sono bene incorporati insiemj metice doi once de sale armoniaco ben trito et mistica bene insiemj in uno vaso de vetrio commo seria uno orinalj et metilo al fornello et falli lo foco temperato per uno di et mezo poi lo leva dal foco et lassalo freddare et troverai collore doro bello et cum lo quale potrai scrivere et distemperalo cum chiara dova rupta bene.

146. *A fare collore doro bello et bono.*—Tolli uno ovo de gallina et falli uno bugio piccolo et cava fora la chiara et lo ventello lassa in la cocia poi lo impe de argento vivo et serra bene quello bugio cum colla poi lo pone socto la gallina covante per spazio de 30 di naturali et haveraj collore doro et distemperalo cum aqua gommata.

147. *Ad fatiendum fregios aureos cum pennello.*—Recipe ar-

² See a recipe somewhat similar in the collection of Le Begue, No. 22.

gum ammoniac,¹ and cut it small with a penknife, and soak it for a night or a day in strong white vinegar or in urine, and afterwards grind it with a little white of egg, and make flowers with your pen, or write upon gold with the paintbrush, and make a fringe or whatever else you like; and when it is dry, breathe on it slightly, lay on the gold and press your hand upon it. When the gold has set, take some cotton, or a hare's foot, and rub it on the gold, and remove the loose gold. And if you wish to make a fringe or flowers with your paintbrush upon figures, add also a little ochre.

148. *To lay dead gold upon colours.*—Take incense, white gum, and sugar candy, of each equal quantities, grind them together, and distemper the mass with strong vinegar or wine, and make it sufficiently liquid not to clog the brush; and it must be thoroughly mixed so as to dry well when applied with the pencil. Lay it on where you wish to put the gold, and when dry, lay the gold upon it, and press it with the cotton; when you have pressed it down well, rub it with the cotton, and the gold will remain clear and fine.

149. *To lay gold upon books, that is, upon paper.*—Take white of egg, well whipped with the milk of the fig-tree, and gum arabic in fine powder, about as much as a nut. Soak it in the white of egg, add to it a little pure saffron, and let it also soak in the white of egg for the space of one natural day. Then take a small sponge or a paintbrush and dip it in the composition, and spread it thin where you wish to lay the gold, and immediately apply the gold; then press it with cotton, let it dry well, and burnish it with a tooth, and it will become bright.

150. *To gild cloth or canvas.*—Take gum ammoniac and put it into a little urine, and let it stand for a night; then make it into a paste with ceruse and a little honey; then lay on the mordant, and the next day lay on the gold. This is good also for laying gold upon paper.

¹ This is the gum resin Ammoniac, and not Armenian Bole, which is mentioned in No. 160 under the term "Bolarminium;" and again in No.

moniacum et incide minutatim cum curtello et pone in forti aceto albo vel in orina ad mollificandum per noctem vel diem postea macina eum cum aliquantulo clare ovi et fatias flores cum penna vel scribe supra aurum cum pennello et fac fregium et quicquid vis et cum siccum fuerit aliquantulum satage et pone aurum et preme manum super aurum et cum captum fuerit aurum habeas de bombage vel pedem leporis et duc super aurum et tolle aurum non captum. Et si volueris facere fregium vel flores cum penello super figuras adde aliquantulum et de ocrea.

148. *A mectere oro senza lustro in suso li collore.*—Havve incenso gomma bianca et zuccaro candio ana, et macina le predictae cose insiemj et stemperale cum aceto forte o cum vino et fallo tanto liquido che non se abombola et vole essere bene remenata tanto che sciuga bene dalo penello et dallo dove voi porre loro et quando e sciuto ponci suso loro, et fermalo cum lo bambagio et quando haverai premuto bene sfregalo cum lo bambagio et loro remara necto et bello.

149. *A mettere oro in suli libri cioe in su le carte.*—Avve chiara dova rupta cum fici lacte multo bene poi torai tanto gomarabico quanto una avellana subtilmente spolverizato et metilo a mollo in la dicta chiara poi torrai uno poco de zaferamj Integro et metilo a molli in la predita chiara per spatium duno dj naturali poi tollj uno poco di spogna et bagnala in la dita compositione o vero cum uno pennello et gratalo dove tu voli metere loro subtilmentj et subito mecti loro et poi lo ferma cum bambagio poi lo lassa bene sciucare et brunisce cum dente et sera lustro.

150. *De aurando panno vel tela.*—Summe armoniacum et pone in modica orina et ibi stet per noctem postea conficitur cum cerusa et modico melle et tunc ponitur dicta ascisa uno die et alio die pone aurum et etiam valet ad ponendum aurum in carta.

161, both "armoniacum" and "Bolarminium" are mentioned. See similar recipes in D. Alessio, Part I. p. 114.

151. *A golden colour for gilding.*—Take gum of almonds and saffron, and grind them on a mortar, and put them into a glass vase; place the mixture by the fire to warm, and afterwards mix some whipped white of egg with it, and paint wherever you like, and it will be of a golden colour.

152. *To make a mordant for gilding on walls.*—Take calcined bone, ground fine with weak glue, such as parchment glue, and let it dry; and when quite dry grind it up afresh with linseed oil, and make it rather stiff; then take a little liquid varnish, and incorporate it with the bone-dust. Add to it a little saffron, sufficient to give it colour, and make it rather stiff. When you wish to put the gold on the wall, the mortar must be dry, and the mordant must not be applied too thick. Let it remain 5 or 6 days, and then put on the gold.

153. *To write with silver.*—Take the silver marchesite,¹ and grind it very fine on porphyry with strong vinegar; then wash it and purify it well with other vinegar. Distemper it with gum-water, and write whatever you think proper.

154. *To make a good and fine silver colour.*—Take tin filings and quicksilver, of each two parts, well pounded with gum arabic wetted with water, and write whatever you please with it; let it dry, and then you may burnish it.

155. *To gild all bodies.*—Take tartar, atramentum,² quicksilver, and salt, and distemper the whole with strong vinegar, and warm the mass a little at the fire, and when you wish to gild, put a little water in the glass, that is to say, some of the above-mentioned water, so as to cover what you cast.

156. *To make a golden colour for writing.*—Take juice of celandine,³ and put it into a well-closed glass flask, place it under horse dung, or the refuse of grapes, and let it remain there for a month; afterwards take it out and grind a little orpiment with the liquor, and put it back into the dung for a fortnight, and then it will be purified. And when you wish to write with

¹ See Beckmann, *Inventions*, Tit. *Zinc*, and Agricola *De Metallicis* p. 435, 436, Venezia 1550.

151. *De auro collore ad aurandum.*—Habeas gummam amangdolarum et crocum et molle in mortario et recollige in vase vitrio et pone justa ignem ut calefatiat postea misce de clara ovj fracta et pinge ubicumque volueris et erit color aureus.

152. *A fare mordente da mectere oro in muro.*—Tolli osso calcinato et subtili macinato cum colla dolce commo colla de carta poi lo lassa seccare poi che e bene secho remacinalo de novo cum olio de semj de lino et fallo uno poco duretto poi tolli uno poco de vernicj liquida et incorporala cum lo sopradicto osso poi li pone uno poco de croco quanto li dia collore et vole essere uno poco duretto e quando voli mectere loro in muro la calcina conviene essere secha poi pone lo mordente non troppo grosso et lassalo stare 5. o 6. di poi mecto suso loro.

153. *A scrivere d'argento.*—Pilglia marchasita che tenga de argento et macina la in porfido bene subtili cum aceto forte poi lavala et purificala bene cum laltro aceto poi la distempera cum aqua gummata et scrivi quello te pare.

154. *A fare collore de argento bello et bono.*—Tolli stamgno limato argento vivo ana parte doj pisto bene cum gummorabico humecttalo in aqua et scrivi quello te piace cum esso et lassa secare poi le porai brunire.

155. *A mectere a oro omne corpo.*—Avve tartaro atramento ariento vivo et sale et distempera omne cosa cum forti aceto et scaldalo uno poco al foco et quando tu voli dorare pone uno poco daqua in uno vaso cio e de la sopradicta aqua tanta che copra cio che tu giette.

156. *Ad fatiendum aureum collorem pro scribendo.*—Recipe succum celidonie et pone in ampulla vitrea et bene clausa ponatur sub fimo equino aut venatia et ibi maneat per mensem postea extrahe et molletur aliquantulum de auropiumento cum ipso licore et remitatur in fimo per quindecim dies tunc erit purificatus quum autem vis scribere mitcte aliquas guttas dicti

² It is by no means clear what the Italians understood by this term. The MS. of Le Begue shows that it had different significations.

³ Celidonia, Chelidonium. A yellow lake is made from this plant.

it, pour a few drops of this liquid into a shell or cornet ; then put in a leaf of fine gold, and liquefy them together, and afterwards write with a pen whatever you like, and burnish the writing when dry.

157. *To make gold letters.*—Take gesso, with which panels are primed, and with which the tailors mark their thread, and ochre, and also a little white of egg, well beaten with a sponge, or otherwise ; grind all these things together for a considerable space of time, and add a little wax from your ear, in order that it may flow freely from the pen. Write where you like, and let it dry, afterwards put the gold on and fix it with cotton ; when dry, burnish it with the tooth of a wolf, or of a sucking calf, or of a mule, or of an ox, or with a stone, or knife.

158. *To write in gold with a pen.*—Take water of cinnabar, and saltpetre, of each equal quantities, one grain of common salt, and one leaf of fine gold, which you must put into a shell along with the before mentioned ingredients in the evening, and let it remain all night ; in the morning write, and the letters will be most beautiful.

159. *To make water for gilding.*—Take 3 jars of water, $\frac{1}{2}$ lb. of roche alum, and 1 oz. of white, that is, calcined tartar, of verdigris about as much as a bean, and one handful of common salt ; pound all well together, and boil them down to one-half or more, and with that water paint what you like.

160. *To make size for gilding.*—Take of gesso sottile about as much as a nut, grind it with clear water, and make it tolerably stiff ; afterwards take some Armenian bole, about as much as a bean, and grind it by itself with clear water. Then mix it with the gesso, and add a sufficient quantity of fine glue already dissolved, a little white sugar, and a little ear wax, and grind all these ingredients together. And know that the glue must be made so as not to stick to the porphyry in the grinding, and when you wish to use it, place it upon hot ashes in order to liquefy it. And note, that if the glue has remained melted in the vase for several days, it is better and lighter ;

licoris in coclea aut cornetto deinde pone unum folium auri fini et liquefac insimul postea scribe cum penna quid vis et quando erit sicce burnias.

157. *Ad faciendum literas auratas.*—Summe gissum cum quo ingessatur tabulas et ocrea i. e. cum aqua saccatoris tingunt filum et modicum et clare ovi bene rupta cum spungia aut aliter et omnia ista insimul macina per magnum spatium deinde tolle modicum de sorde aurium et macina insimul ita quod currat scribendo deinde scribe ubi vis et dimicte siccarj postea pone aurum desuper et firma eum cum bombige et quando fuerit siccum burnias cum dente lupino vel victule lactentis vel mule aut bovi vel cum lapide aut telbella [coltello?].

158. *Ad scribendum aurum cum callamo.*—Tolle aqua cinabrij sal nitrij et unum granum salis comunis ana et unum folium auri fini quem pone in una coclea simul cum predittis rebus in sero per noctem et in mane scribe et erunt pulcherrime.

159. *Ad fatiendam aquam ad aurandum.*—Habeas tres orciolos aque et libram mediam aluminis roccj et untiam unam tasi albi i. e. calcinati et viride ramum quantum est faba et manipulum unum salis comunis et bene ad invicem pistentur et tantum bulliat quod deveniat ad medietatem vel plus et cum aqua illa pinget quid vis.

160. *Affare scisa da mectere oro.*—Habeas gissum subtilem quantum est nux et macina cum aqua clara et fatias eum aliquantulum sodum postea Recipe bolum arminium quantum est faba et macina eum de per se cum aqua clara postea misce cum predicto gisso deinde habeas collam nobilem distemperatam et mite intus quantum necessarium est postmodum pone intus aliquantulum zucheri albi et aliquantulum fectie auricularum et predicta insimul macina. Et scias quod colla debet esse taliter quod in macinando se adhereat porfido aliquantulum et quando vis operare pone eam super calidum cenigem ut bene liquescat et nota quod si colla staret aliquibus

and if the mordant is laid too thickly upon the paper, scrape it smooth and thin. When you wish to lay the gold on it, bathe it with clear water, put on the gold, and fix it with the cotton, and when it is dry burnish it well with a tooth. If the mordant is too soft, put a little white of egg into the water, when you are applying the gold, or add some to the mordant, and it will be good.

161. *To make size for gilding.*—Take gum ammoniac, and grind it first without water, and then with the juice of garlic, to which add a little Armenian bole, and when the mass is dry, it must be ground up again with the garlic juice; then apply it where you please, and afterwards lay on the gold.

162. *To draw outlines of gold with size.*—Take gesso sottile,¹ and grind it with white of egg, neither beaten nor whipped, add to it a little honey of roses,² and a drop or two of weak size at discretion, with a little ear wax. Then make the outlines or other things, and, when dry, breathe upon them a little, and immediately apply the gold, and press it gently with the cotton; then burnish it, and it will be lustrous and beautiful.

163. *To make letters of gold—proved, and true.*—Take fine gold, and grind it on porphyry with roche alum; then take up very carefully the gold and alum, and put the mixture into a glass saucer; wash it several times with tepid water, then with cold water, and each time let it settle, in order that the gold may sink to the bottom; when the gold is well purified and cleansed, let it dry. When you wish to use it, distemper it with gum water, and write whatever you please; let it dry, and then burnish it if you think proper.

164. *To write gold letters with a pen as before.*—Take fine gold leaf and mix it with white honey in a saucer, then grind it upon porphyry very fine with common salt, wash it with hot water like “smalto,” and do as before.

¹ See No. 213.

diebus in vasculo distemperata esset melius et levius et quando ascisa esset nimis grossa super cartam rade eam ut sit bene equales et subtilis et quando vis super eam aurum ponere balnea eam cum aqua clara et pone aurum et firma cum bombice et cum siccum fuerit bene cum dente burnias, et si esset nimis dulcis pone in aqua quando mictis aurum pone desuper ascisa vel cum aqua aliquantulum clare ovi et bonum erit.

161. *A fare scisa per mectare oro.*—Recipe armoniaco et macinalo senza aqua poi tollj sugo dalglio et macina lo armoniaco cum lo ditto sugo et mectice un poco de bolarminio et quando fusse secco se vole remacinare cum lo dicto sugo e dallo doi voi poi mete loro.

162. *A fare il profilo doro cum scisa.*—Tolli gesso subtili et macinalo cum chiara dovo che non sia rupta ne dibatuta et metice uno poco de mele rosato et alcuna goccia de colla dolce a tua discretione cum uno poco de scaratura de orecchie et poi fa li profili, o altro et quando e secco ansciare suso uno poco e subito mette loro et calcalo uno poco cum lo bambagio poi lo brunisse et sera lustro et bello.

163. *A fare lettere doro provata et vera.*—Havve oro fino et macinalo in porfido cum alumj de rocho molto bene subtili poi recolgli el dicto oro et alumj macinato molto bene et metilo in una scudella de vetrio poi lo lava piu volte cum aqua tepida et poi cum la fresca et omni volta lassa possare acio loro se ne vada in fundo et quando loro sera bene purificato et netto lassalo secare et quando lo vorai operare distemperalo cum aqua gomata et scrivi quello te piace et lassa seccare e poi lo brunissci parentoti.

164. *A scrivere oro cum penna ut supra.*—Havve oro fino in foglio et mistalo cum mele bianco in una scudella poi lo macina in porfido overo macinalo in porfido cum sale comuno molto bene subtili poi lo lava cum aqua tepida ad modo de smalto et seguita commo de sopra.

² The Ricettario Fiorentino gives a recipe for this compound. It consists of Infusion of Roses, 6 lbs.; white sugar, 2½ lbs.; best honey, 1½ lb.

165. *The same—another way.*—Take a little gum, white, fine, and clear, and soak it in a shell with a little rose-water for the space of one natural day or night; then take a clean glazed saucer, and moisten the saucer with the liquefied gum. Next take fine gold leaf, and mix it with the gum, and having ground it fine, wash it as you did before, until it be well washed, purified and cleaned. Distemper it with gum water, in the manner I mentioned in the other recipes.

166. *To make a mordant for burnishing and laying on gold.*—Take of gesso sottile as much as a nut, a little vermilion, sufficient to give it colour, and a piece about twice as large as a bean of hepatic aloes,¹ and grind all together with clean water on porphyry or marble, until reduced to a very fine powder. Then let it dry, and grind it again with water; let it dry again, then grind it afresh with gum-water mixed with half as much again of white of egg, and with a little honey of roses, and a piece about the size of a bean of sugar candy; grind all these things well together, and while grinding add a little wax from the ear. When ground, put the powder into a small horn and let it settle for the space of two or three days; then throw away all the scum which will rise to the top, use it, scraping away the thicker parts, and immediately apply the gold and burnish it.

167. *To make a good mordant for gilding, which is easily prepared.*—Take good weak glue, with a little gesso sottile and a little saffron, grind it all together; then lay the mixture wherever you like and let it dry. Then, breathing on it, lay on the gold and burnish it.

168. *To make a golden colour for writing with a pen on paper and canvas.*—Take tin and quicksilver in equal quantities at pleasure, first put the tin to melt in a crucible, and when it is melted pour into it the quicksilver, and mix the ingredients well with a stick, and incorporate them together, and they will

¹ This substance was formerly much used in varnishes to give them a yellow colour. See No. 204.

165. *Ad idem per aliam viam.*—Tolli uno poco de gomma bianca et bella et chiara et metila a mollo in una coccia cum uno pocho daqua rosata per spatio duno di naturali o nocte poi tolli una scudella vitriata bene necta et unge la dicta scutella cum la dicta gomma liquefatta poi tolli oro fino in folglio et mistalo cum la dicta gomma poi lo pone a macinare bene subtili et lavallo commo facesti disopra tanto che sia bene lavato purificato et necto et lo distempera cum aqua gomata ut te certioremi feci in aliis receptis ut supra.

166. *A fare scisa per brunire et porre oro.*—Avve gesso subtili quanto una noce et uno poco de cinabrio quanto li dia colore et quanto seria doi fave de aloe pattico et macina omne cosa insiemj cum aqua chiara in porfido o in marmo tanto che sia sutilissima poi la lassa secare poi la macina una altra volta cum aqua et lassa secare poi la remacina de novo cum aqua gomata et chiara dovo la mita piu che laqua gomata et un poco de mele rosato et quanto una fava de zucaro candio et macina multo bene insiemj omne cosa et macinado metice uno poco de bructura de orecchie et macinata che sera metila in lo corneto et lassala possare per spatio di doi o tre di po gietta via tutta quella schiuma che ella mandara di sopra poi ladopera radendo le parti grosse poi ansiando et subito mete loro et brunisce.

167. *A fare scisa bona et breve per mettere oro.*—Pilglia colla gentili che sia dolce cum uno poco de gesso subtili et uno poco de zafferamj et macina omne cosa insiemj poi lo pone dove voglj et lassa secare poi ansiandoce metti loro et brunisce.

168. *A fare collore doro da scrivare cum penna in carta et in tela.*—Tolli stagno argento vivo ana el tu volere prima pone lo stagno in uno crugliolo a fundare et quando sera bene fuso buttace dentro lo argento vivo et mistalo molto bene cum uno bastone et incorporali bene insiemj et vira ad modo de polvere

become like dust; then throw this dust into a saucer, and take sulphur and sal-ammoniac of each the same quantity as of the quicksilver; pound the whole very fine, and mix it all together, put it into a bottle luted from the neck downwards. Close the bottle well with an iron cover and lute the top of it with lutum sapientiæ; then set it to boil over the fire until the moisture is evaporated and consumed by a slow fire. Let it cool, and break the vase, and you will find a fine and good golden colour; and when you wish to write, take some of this mixture, and grind it very fine with white of egg; then put it into a horn and write, and the letters will appear fine and shining.

169. *To lay gold on paper for letters.*—Take gesso sottile, and grind it with glue not too strong; then add small quantities of Armenian bole, sugar candy, red sugar, and honey of roses, grind the whole together, and apply it wherever you like, and when dry, scrape the rough parts, and breathe on the paper, and immediately put on the gold, and then burnish it.

170. *To make a mordant for burnishing and gilding.*—Take a little gesso well ground, and then take one-third part of parchment glue, and soak it in water; grind it all together with a little minium, and it will be good.

171. *To make mordants for gilding on figures, on canvas, on stone, on wood, on gesso, and on mortar or walls.*—Take litharge, verdigris, and a little ochre, and grind them with a little linseed oil and liquid varnish; incorporate them well together, and then gild in the usual manner.

172. *To make a water for gilding all things.*—Take the marcasite of gold,¹ and grind it well upon porphyry with very strong vinegar; then boil, and treat the mixture like salts; afterwards distil it through an alembic, and three waters will

¹ Auriferous Iron Pyrites. Phillips (Mineralogy, pp. 219, 324) says this mineral contains gold. Beckmann (Inventions, Tit. Zinc) remarks, that that was the true Marchasita aurea which contained Zinc. He adds this is properly a stone, the metallic particles of which were so entirely sublimated by fire, that nothing but useless ashes remained behind.

poi butta questa polvere in una scudella poi tollj solfo et altrettanto sale armoniaco egualmente quanto fu lo soprascripto argento vivo et pista menuto bene subtilj et miscola insiemj omni cosa et metila in una boccia alutata dal collo ingiuo et obtura molto bene la bocca cum uno coperchio de ferro et disopra obtura cum luto de sapientia poi lo pone a bullire al fuoco per in fino che le humedita de le dicte cose siano giallate via et consumate cum fuoco temperato poi lassa fredare et rompe lo vaso et trovarai collore doro bello e bono et quando tu voraj scrivere tolli de la dita mistura et macinala cum chiara dovo bene subtili poi lo pone in uno cornecto et scrivi poi apareranno lustre et belle.

169. *A mectare oro in carta cum litera.*—Tolli gesso subtili et macinalo cum colla non troppo forte poi ce pone uno poco de bolo arminio et uno poco de candio et uno poco de zucaro rosso et uno poco de mele rosato et macina insiemj et dallo dove voi et quando e secco rade le parti grosse et ansciace suso et subito mete loro poi brunisce.

170. *A fare scisa da brunire e porre oro.*—Avve uno poco de gesso ben trito poi tolli la quarta parte de colla de carte et polla a mollo cum laqua poi macina omne cosa insiemj cum uno poco de minio et sera bona.

171. *A fare mordenti da metere oro in figure in panno in petra in ligno in gesso e in calcina o muro.*—Recipe litargirio verderamo et uno poco de ocria e macinale cum uno pocho de olio de seme de lino et cum uno poco de vernice liquida et incorpora multo bene insiemj poi fa commo se fa per mectere oro.

172. *Ad afare una aqua da dorare omnia.*—Summe marchesitam auri quam optime tere super porfidum cum aceto acerrimo et inde bullant ut fiant sicut sala postea distilla per alembicum et exhibunt tres aque cum prima scribitur in carta cum

It contained fixed quicksilver, communicated a colour to metals, burned in the fire, and was at length entirely consumed. Agricola had said the same thing 200 years before. Compare Agricola de Metallicis, pp. 181, 343, 376, 436, 438, Ed. Venezia, 1550; and see Matthioli, 1443.

come over. With the first you may write on paper ; with the second, which is red, you may write on canvas, on iron, or on gesso, and when it is dry rub it with a rough cloth, and it will become fine and shining gold ; and with the third, which is black, you may write upon glass, and when it is dry you may rub it with a very harsh and rough cloth, and it will be splendid gold.

173. *To make a mordant for gilding on paper, and for burnishing according to the German manner.*—Take gesso sottile and white clay in equal quantities, and temper them, as if for writing, with white of egg beaten up with the milk of a fig-tree ; write whatever you like upon paper previously polished with a tooth. Then let it dry and scrape off the rough parts. Then take white of egg coloured with saffron, lay on the white of egg by degrees with the paint-brush, and directly afterwards apply the gold or silver leaf, press it lightly with the cotton, and let it dry. When dry, clean it with bread-crumbs, first polishing it with a tooth, and it will stand well.

174. *To make purple oricello.*—Oricello has a purple colour ; boil some water, when it is hot liquefy the oricello in it, and rub it hard, and press it through a strainer into a glass goblet, boil the water as you did before, and strain it two or three times. Then put a strip of saffron and a piece of gum into an egg-shell, and warm it on the coals, and do this 2 or 3 times, and the next day, when that water has settled, strain it well through a strainer and distemper it, and lay it upon paper, and write, and then let it dry. Then take gum ammoniac and grind it well with ley, and mix a little vermilion with it, and write whatever you like upon the oricello with a paint-brush or a pen, and let it dry. Having done this, take a leaf of gold between your little finger and thumb, blow upon the leaf, and place it upon the gum ammoniac, and fix it well first with your finger and afterwards with a stone, but do not rub it. Clean it with bread crumbs ; do this once or twice ; if you mix the oricello with lake or vermilion it will be brighter.

175. *For the same, another way.*—Take the milk of the fig-

secunda que est rubea scribitur in tela aut ferro vel in gisso et ea sicca fricatur cum panno aspero et fiet aurum pulcrum et lustrum: cum tertia vero aqua que est nigra scribitur super vitrium et ea sicca fricatur cum acerrimo et aspero panno et fiet aurum nobilissimum.

173. *A fare scisa per metere oro in carta e per brunire secondo luso thodesco.*—Invenies gissum subtilem et cretam albam equaliter et bene tempera cum clara ovj que sit rupta cum fici lacte et eam tempera ad usum scribendi et scribe quid vis in carta prius cum dente polita et permicte siccarj et inde rade rudes partes deinde tolle claram cum crocho coloratam et cum penello paulatim supermicte claram et postea statim supermicte folium auri aut argenti et firma eum modicum cum bomboce et permicte sicari et sicco purifica eum panis mulica prius cum dente polita et peroptime manebit.

174. *Ad auricellam purpuream fatiendum.*—Auricellam purpureum habet collorem sed bulli aquam bene et captefacta auricellam liquefac intus et frica fortiter et frica per stamineum in parascide vitreo et iterum bulli aqua similiter ut prius fecisti et pro bis vel ter cola aquam illam et sic filo croci et gummj in testa ovi et calefac super prunam et feceris bis vel ter in sequenti die aquam preditam cum resedit bene iterum cola per stamen et colata tempera et in carta pone et scribe inde permicte sicari postea tolle armoniacum et ipsum fortiter tere cum urina et immisce aliquantulum de cinaprio postea super auricellam cum penello vel pennam quod vis scribe et permicte sicari. Hoc facto tolle folium auri et digito parum vidat et ad maximam druge folium et super armoniacum pone et cum digito ferma bene postea cum lapide et noli fricare et cum panis mulica purifica hoc fac semel vel bis demum sublimj capum auricelle cum laccha vel cinabrij et clarius erit.

175. *Ad idem alio modo.*—Summe lac ficus et misce cum

tree, mix it with white of egg reddened with vermilion, and write what you please upon paper, and let it dry ; then lay the juice upon it and do not rub it, but press it with a stone, and polish it with a fine cloth.

176. *To make water of quicksilver¹ for gilding ostrich feathers and other things very beautifully.*—First lay a stratum of common salt in a retort, and on that lay quicksilver, cover the vessel with an alembic with a very large head, and let the retort be a very long one. Distil it with a slow fire, and afterwards preserve it, and when you wish to use it, take some of the water and dip in it an ostrich feather, wetting it on each side, and let it dry well ; do this twice, and the third time dip it and do not dry it, and while it is still wet spread gold leaf on both sides of it, and hold it to the fire and shake it, for the whole feather will then become gilt.

B. 177. *To make a mordant for gilding on paper, on walls, and on everything else, &c.*—Take parchment glue, pour on it a little cold water, and let it stand 3 days in the shade ; then put it in the sun until it becomes decomposed, and if there is not enough water, add more to it ; and when quite decomposed, reduce to powder some tiles or red earthen vessel not over-baked, or gesso sottile, and mix them well together, and then spread the mixture thinly wherever you like, lay the gold on it, and let it dry, and then burnish it with a boar's or a horse's tooth.

B. 178. *To write in gold on any cloth you like.*—Take ox-gall dried in the smoke, distemper it with gum arabic, and write wherever you like ; when it is nearly dry, apply gold upon it, and it will be good, &c.

¹ In this recipe, the term "Azoch" is used to denote the metal mercury or quicksilver. It is derived from the Arabic. From the Arabic it passed into the vocabulary of the Alchemists, where it was used to denote the mercury of metals, the first principle of metals, and an universal medicine. Paracelsus used to boast that he had a spirit at his command, called "Azoth,"

clara rubificata cum cinabrio et quodvis scribe in carta et per-
mitte sicarij deinde superpone succum et noli fricare sed cum
lapide firma et cum pano levis purifica.

176. *Ad fatiendum aquam azoch ad deaurandum pennas
strutii et alia valde pulcherrime.*—Primo fac stratum salis co-
munis in urinali et superpone azoch vivum et superpone alem-
bicum cum capite valde magnum et sit orinale bene longum et
distilla cum lento igne postea serva et cum vis operari tolle de
dicta aqua cum qua madefatias pennam strutii ab utroque latere
et dimicte bene sicari et sic fatias bis terzia vice balnea et non
sicces et super eam sic balneatam extende folia solis ab utraque
parte et monde ad ignem, et scurla quia tota ibi penna efficitur
aurea.

B. 177. *Affare scisa da pore oro in carta muro et in omni altro
luoco.*—Recipe colla de carta et mectili uno poco daqua chiara
et lassala stare tre di alombra poi la pone al sole tanto che
diventa tucta putrefacta et marcia et puzzolento et se mancasse
laqua agiongnicine et quando e bene diffatta fa polvere de tegoli
o de coppi rossi non tracotti overo gesso subtili et misticale in-
siemj et poi dalla ove tu [vuoi?] subtili et desopra pone loro
et lassa secare de poi lo inbrunisce cum uno dente porcino o
cavallino etc.

B. 178. *A scrivere doro in omne drappo che voi.*—Recipe
fele de bo secco al fumo et distemperalo cum gomarabico et
scrivi ove tu voli et commo e quasi secco pone sopra loro et sera
bello etc.

whom he kept imprisoned in a jewel; and in many of the old portraits he
is represented with a jewel inscribed with the word "Azoth" in his hand.
The Spanish name for mercury, Azogue, is derived from Azoth.

HERE BEGINS THE HEADING OF THE SEVENTH
CHAPTER

ON MAKING VERMILIONS, AND MANY OTHER COLOURS OF DIFFERENT KINDS. AND ON THE MIXING OF COLOURS; AND OF THE TEMPERING OF COLOURS, ACCORDING TO MAGISTER JACOBUS DE THOLETO. AND FIRST TO MAKE VERMILION.

179. *To make vermilion.*—Take of quicksilver two parts, of sulphur one part; first melt the sulphur, then add the quicksilver, mix them well, and reduce them to powder, and then put the powder into a flask luted with lutum sapientiæ as high as the neck. Place the flask on the ashes until all the humidity is driven off; then close the mouth of the flask with cotton, and give it a tolerably strong fire until the matter rises to the neck of the flask and is very red; then take it from the fire, let it cool, and it is done.

180. *To make vermilion.*—Take 1 lb. of sulphur vivum, with one pound of quicksilver, and 4 oz. of tin; put them into a crucible well covered with lutum sapientiæ, apply heat until a knife held to the opening of the crucible is no longer discoloured or turned blue, and you will have good vermilion.

181. *For the same, another way.*—Take of sulphur vivum 3 lbs., put it into a basin, and cover it with another basin, and make a fire under it, and, when it is melted, add a pound of mercury, and incorporate them well by mixing them until they harden; when cold, grind the mass well upon marble, put the powder into a bottle, and close up the mouth of the bottle with earth; make a moderate fire under it, and when you see the contents rise so as to fill the whole of the bottle, remove it from the fire, and let it cool. Then break the bottle, and it will be perfect vermilion.

INCIPIT DISTINTIO SEPTIMI CAPITULI

DE CINABRIS FIENDIS. ET MULTIS ALIIS DIVERSIS COLLORIBUS. ET DE MISTURIS COLLORUM. ET AD COLLORES DISTEMPERANDUM SECUNDUM MAGISTRUM JACOBUM DE THOLETO. ET PRIMO AD FATIENDUM CINABRIUM.

179. *Ad cinabrium faciendum.*—Reccipe argento vivo parte doi solpharo parte una et prima disfa lo solpho de po ce pone lo argento vivo et misticali bene et redulli in polvere depoi lo pone in una ampolla lutata da luto de sapientia in fino al collo poi la pone sopra le cinige per infino a tanto che le humidita sieno andate via poi serra la bocca de lampolla cum lo bambagio e dalli lo foco uno poco grande per infino che la materia monta a presso el collo de lampolla e sia bene rosso de po li tolli lo foco e lassa fredare e fatto.

180. *Ad faciendum cinabrium.*—Summe libram j sulphuris vivi cum una libra argenti vivi et quatuor untias stangni et pone in crisole bene obturato cum luto sapientie et quoque tam diu quod cultellus non blueatur a foraminibus crugibuli et habebis cinabrium bonum.

181. *Ad idem alio modo.*—Recipe sulphur vivi libras tres et pone in una paraside et coperi eam bene cum alia paraside et fac subtus ingnem et quando est liquefactum pone intus unam libram mercurii et incorpora bene mistando dummodo induratur et quando frigidum fuerit macina eum bene super marmorem et pone eam pulverem in una bocia et claude os botie terra e-fac subtus unum modicum ignis et quando vides quod ellevatur intantum quod impleat totam bociam tunc remove ab igne et dimite frigidari deinde frange bociam et erit cinabrium perfectum.

182. *To make vermilion.*¹—Take 1 part of quicksilver and two parts of sulphur, clean, yellow, and well ground; put all into a bottle and cover it lightly with lutum sapientiæ; then put it into the furnace, and give it at first a gentle fire; cover the mouth of the bottle with a tile, and when you see a yellow smoke, keep up the fire until you see the smoke come off red or scarlet; then remove the fire, and when it is cold you will find fine vermilion.

183. *For the same, another way.*—Take a glass jar luted with lutum sapientiæ up to the neck, then take 2 parts of white sulphur well ground and one part of quicksilver; afterwards put them into the flask; then make a small charcoal fire, and place four stones round it; set the flask upon them, and cover it with a tile. Uncover it frequently; and when you see a blue smoke come out of it, cover it up until you see a red smoke; then take it away from the fire, for it is done.

184. *To make a yellow for drawing gold flowers on paper.*—Take a little saffron and a little white lead, and distemper them together with gum-water; let them stand so as to be well incorporated for half an hour, and it is done.

185. *To make a very beautiful white.*—Take egg-shells and well-pounded glass and mix them together; then put the mass into an earthen jar, and place the jar in a furnace for one natural day. Then take it out and keep it. And when you wish to use it, grind it very well upon marble, and distemper it with gum-water.

186. *To make vermilion quickly.*—Take 1 lb. of lead, $\frac{1}{2}$ lb. of quicksilver, and 4 parts of yellow sulphur; grind all these things well together, and put them into an earthen jar over the fire for 14 hours, and it will be done.

187. *To make camillina.*—Take vermilion, azure, and ceruse, and grind them together; and if the colour is to be dark, put more vermilion and azure, and it will be good.

¹ Recipes nearly similar to this and the next are contained in the MS. of Le Begue, Nos. 174, 175.

182. *Ad faciendum cinabrium.*—Tolli una parte de argento vivo et doi parte de solfo giallo e necto e ben macinato poi pone omne cosa in una boccia et incoprila legiermente cum luto de sapientia poi la pone in lo fornello et dalli da prima lo foco ligiero et copre la bocca della boccia cum una tegola, e quando tu vederai lo fumi giallo continua lo foco per infino che vederai uscire el fumo rosso o vermeggio allora tolj via lo fuoco et quando sera freddo troverai bello cinapro.

183. *Ad idem alio modo.*—Habeas unam ampollam vitream lutata de luto sapientie usque ad summum collj deinde recipe partes duas sulfuris albi et bene triti et partem unam argenti vivi postea pone in ampulla sopradicta et fac de carbonibus ignem lepidissimum et circa eam cum quatuor lapidibus et pone ampullam desuper et coperi eum cum tegula et sepe discoperias et quando videbis fumum lividum coperi dummodo videbis exire fumum rubeum tunc tolle ab igne quod factum erit.

184. *Affare collore giallo per fiorire in oro in carta.*—Reccipe un poco de zaffaramj e uno poco de biaccha et stempera insiemj cum aqua gomata et lassa cusi stare acio se incorpora per una mez' hora et sera facto.

185. *A fare biancho bellitissimo.*—Tolli cociole dova et vetrio bene pisto et misticali insiemj et poi la pone in uno in uno vaso de terra et mettilo in una fornace per uno di naturali poi lo cava fora et serbalo. Et quando lo vorai operare macinalo molto bene in marmo e distemperalo cum aqua gomata.

186. *A fare cinabrio brevemente.*—Abeas libram j plumbi et mediam libram mercurii et quatuor partes sulphuris gialli et omnia insimul acriter tere et pone in vase terreo ad ignem per horas 14^{im} et erit factum.

187. *A fare camillina.*—Tolle cinabrium azurum et cerusam et macina insimul et si esset obscurum mictre plus de cinabrio et de azurro et bonum erit.

188. *To make a violet colour.*—Take a little indigo, a little vermilion, and a little ceruse, grind them very fine and dis-temper them, and you will have a fine violet colour.

189. *To make the red colour for shading gold letters on paper.*—Take scraped ver-zino and put it in a horn-shaped vessel, with sufficient white of egg to cover it; let it remain in the sun for a day; afterwards press it out, and keep it in a well-closed glass flask; and, when necessary, use it for the red outlines of gold letters.

190. *To make a flesh colour for painting the flesh of figures.*¹—Take sinopia and ceruse, and apply it wherever you wish to paint flesh; when it is dry, take black and mark the eyes and limbs, and lay on the lights with pure ceruse; and for the eye-brows use sinopia and black together, and it will be brown; the pupil is made with black and no white, and the shade of the jaws with sinopia, and the effect will be good.

191. *To colour the flesh in painting a crucifixion.*—Take ochre, ceruse, and a little terra verde, mix them together and lay them on the figure, and when dry, mark out the limbs with black made with charcoal, with which mix a little sinopia, lay on the lights with ceruse, and do as you like. Paint the hair with sinopia and charcoal mixed and pounded together.

192. *To make flesh colour.*—Take indigo mixed with orpiment, and it will make green, which, mixed with ochre² and white, makes flesh colour.

193. *To make another camillina colour.*—Know that by mixing ceruse with ver-zino it will become a camillina colour; and if you wish to make violet add a little azure. And if you wish to make green take a little indigo and orpiment.

194. *To make good and fine arzica.*—Take one pound of weld, which the dyers use, cut it very fine, then put it into a glazed or tinned vase, and add to it enough water to cover the herb. Make it boil until the water is half wasted, and if there

¹ It is probable that this and some of the following recipes were derived from the Greek (if not immediately translated from it). Sinopia is mentioned for the first time in this recipe; it is also probable that this colour

188. *A fare colore violato.*—Prima tolli uno poco de indico et uno poco de cinabrio et uno poco de cirusa et macina bene subtili et distempera et vira fino violato.

189. *A fare collore per porre sopra la rosecta de loro in carta.*—Summe verzinum abrasum et pone in corneto cum tanta ovorum clara preparata ut coperiatur et dimite manere ad solem per unum diem postea exprime eum et serva in ampulla vitria bene obturata et quando necesse est utere in li profili de la lectra de la rosecta de loro.

190. *Ad fatiendum incarnatum pro incarnare figuras.*—Tolle sinopiam et cerusam et michte ubi vis incarnare et cum siccum fuerit tolle nigrum et reinvenias oculos et alia membra et illumina cum cerusa viva et super cilia sinopia et nigrum insimul et erit brunum luciula fiet de nigro et puntum album et in mascillis umbra de sinopia rubea et bene stabit.

191. *Ad incarnandum crucifixum.*—Abeas ocream et cerusam et aliquantulum de terra viride et misce simul et pone in crucifixo et cum siccum fuerit reinvenias membra cum nigro facto de carbone et misce cum eo aliquantulum de sinopia et expleas opus cum cerusa et fac sicut tibi videtur pilos fac de sinopia et carbone misto et insimul pisto.

192. *Ad faciendum incarnatum.*—Capias indicum mistum cum auripiumento et fiet colorem viridem ocrea et album insimul incorporata veniet incarnatio.

193. *Idem alius color camillinus.*—Scias quod ponendo cerusam cum verzino erit color camillinus et si vis facere violatum pone aliquantulum de azurro. Et si volueris facere viridem pone modicum indici et auripiumenti et fiet viridem.

194. *A fare larzica bona et bella.*—Piglia libra una de herba gualda la quale opera li tentore et tagliala ben minuta poi la pone in uno vaso vitriato o vero stagnato et metice tanta aqua che copra la dicta herba et falla tanto bulire che torni per

was the Sinopia of Cennini (the Red Hæmatite), and not the colour of this name, described by S. Audemar, p. 145.

² This must be burnt ochre.

is not enough water add a sufficient quantity and no more ; then take 2 oz. of travertine finely ground, or 2 oz. of white lead, and $\frac{1}{2}$ oz. of roche alum ground very fine, then put all these things together a little at a time to boil in the vase directly, before the water cools, and stir the water continually, remove the vessel from the fire, and when nearly dry, pour off the water. Then take a new brick hollow in the middle, lay the arzica on it, and let it settle perfectly ; then put it on a small and well polished board to dry, and it is done.

195. *To make white lead.*—Take leaden plates, and suspend them over the vapour of very strong vinegar in a vase, which after being luted must be placed in dung for two months ; then scrape away the matter that you will find upon the plates, which is the white lead. Do this until the plates are consumed.

196. *To make minium quickly.*—Take calcined litharge, and lead, prepared together over the fire, and you will have minium.

197. *To make paste for sculpturing all kinds of things, that is to say, figures and medallions, and to make moulds.*—Take white lead and mastic, and put the mastic to soak in sufficient clear water to cover it for the space of one night ; then make this water with the white lead into a hard paste like dough, and knead it well with your hands. When you wish to model anything, knead the paste with your hands, having previously greased them well with lard. Then impress whatever you like on the paste and let it dry, and the impression will be sharp and fine. And you may make the paste of any colour you like, by mixing up some colour with the paste.

B. 198.¹—Take 1 oz. of tragacanth, and put it to soak in sufficient water to cover it for the space of one day and one night ; then take a pound of white lead and grind it with the moist tragacanth. Then let it harden till it is as stiff as dough, and knead it well with your hands, adding to it a little white

¹ The Rubric is wanting. It appears to be a recipe for making artificial Cameos.

mita et se mancasse laqua arigiognicine quanto bolla et non piu poi poi tolli once doi de travertino molto bene macinato overo doi once di biacca et meza oncia de alumj de roccho bene subtili poi mete tutte queste cose a bulire in lo dicto vaso subitamente nante che laqua se fredda e mete queste cose a poco a pocho tuttavia remenando laqua et leva dal foco et quando sera a presso che fredda et tu ne cava via laqua poi tolli uno mattone novo cavato in mezo et metice dentro lo colore de larzica et lassala reposare multo bene poi la pone in su una asicella bene polita a secare e de fatta.

195. *A fare biacha.*—Tolli lamine de piombo et metile disopra alo vapore de lo aceto fortissimo in uno vaso et copriolo bene cum luto et metilo socto lo litamj per doi mesi poi rade la matheria che e la biacha che trovarai sopra ale lamini et fa per lo sopradito modo per infino che sonno consunte.

196. *A fare minio brevemente.*—Avve calcina de litargirio cum piombo confectato insiemj al foco et sera minio.

197. *A fare pasta da scolpire omne lavoro cioe figure medaglie e fare forme.*—Piglia biacha et mastice et pone la mastice a mollo in tanta aqua chiara che stia coperta per spatium duna nocte poi impasta la dicta aqua cum la dicta biacca dura ad modo de pasta et menala bene per le mano. Et quando vorai scolpire ungitte le mano cum lardo bene et menala bene per mano poi imprompta quello che tu voj et lassa secare e vira necto et polito et poi la fare venire de quello colore che tu voli mistando insiemj cum la pasta.

B. 198. Recipe once una de draganti et metili a mollo in tanta aqua che se copriano per spatium de uno di et una nocte et poi tolli una libra de biacca et macinala cum lo dicto draganti mollo et poi lo indura ad modo duna pasta et menalo molto bene per mano et mistace uno poco de mele bianco acio non

honey in order that it may not crack. Anoint your hands with the honey, and let the paste be well kneaded; then impress whatever you like upon it, and the impression will be sharp and fine. You may make it of whatever colour you please by mixing some colour with it, and when you have taken the impression, you must glue it on with glue made from parchment clippings, and let it dry, and when it is well dried polish it with a tuft of cotton, and it will become shining like a bone, &c.

199. *Also another colour.*—Take green and ceruse, and make a drapery or a leaf, shade it with pure green, and then make the outlines with black or with verzino; lay on the lights with ceruse, and do this with all the colours, and when you wish to make flowers with azure, add a little yolk of egg; and for roses add a grain of salt.

200. *To make another camillinus colour.*—Azure mixed with white is a camillinus colour; with orpiment a splendid green; with saffron, it is also green; and with dragon's blood, or with lake, it will be a purple colour.

201. *To make a rose colour, very good and beautiful.*—Take $1\frac{1}{2}$ oz. of lac, and the same quantity of ceruse; grind them with linseed oil¹ and prepared white of egg, and apply upon paper. If you wish the colour to be very good, take an equal quantity of grana, and grind with the other ingredients, and you will have a finer colour.

202. *To make a blue colour.*—Take orpiment and lac, of each equal quantities, and grind them together with prepared white of egg; and you will have a blue colour.

203. *To make a light rose colour for miniature.*—Take travertine pounded fine, as much roche alum as travertine, and an equal quantity of scraped verzino; boil the verzino with strong ley, and, when it boils, add the other ingredients and reduce it one half; then strain the liquor through a loosely woven cloth, and you will have a fine rose colour.

¹ It appears from the treatise of Cennini, chap. cxliii., that it was a common practice to mix lake with linseed oil for draperies.

crepe et ungit le mano cum dicto mele et fa che sia bene remenata et poi impronta quello te piace et vira necto et bello et poila fare venire de che collore tu voli mistando cum essa el dicto colore et commo tu hai improntato se vole incolarla cum colla de carnicia et lassa sciugare et quando sera bene sciucta et tu la polisce cum uno matoffo de bambagio et vira lustra como uno osso etc.

199. *Idem alius color.*—Tolle viridem et cerusam et fac vestimentum vel folium postea umbra cum viride puro postea profila cum nigro vel verzino deinde illumina cum cerusa et sic poteris facere de omnibus coloribus et quando vis facere flores cum azurro pone aliquantulum de vitulo ovj et quando rosas pone unum acinum salis.

200. *Ad faciendum alium colorem camillinum.*—Azurrum cum albo misto est color camillinus cum auripiumento est viridis pulcer cum zafaramino est etiam viridis et cum sanguine draconis aut lacca erit color purpureus.

201. *Ad faciendum colorem rosatum optimum et pulcrum.*—Recipe lac untiam unam cum dimidia et tantundem ceruse et macina cum oleo seminis lini et cum clara ovj preparata et pone in carta et si vis magis coloratum et optimum acipe tantundem grane et macina insimul et habebis.

202. *Ad faciendum colorem perseum.*—Habeas auripiumenti et lac de utroque tantum et insimul macina cum clara preparata et habebis.²

203. *A fare la rosetta per miniare.*—Tolli travertino subtilmente pisto et tanto alumj de rocho quanto fu lo travertino et altratanto verzino raso et metti lo verzino a bulire cum ranno forte et quando bolle metlice le sopradite cose et fa bolire che arentre per mita et poi lo cola per una peza rareta et haveraj bella rosetta.

² There is apparently a mistake here, for "perso" signifies dark blue, and orpiment and lake would produce an orange colour.

204. *To make a certain water which is good for applying upon figures and other miniatures.*—Take oil of aloes, linseed oil, and liquid varnish, of each equal quantities; boil these ingredients together, and put them into a flask. When you wish to use the liquor, anoint with it the figures or miniatures when they are dry, and not before, and they will be shining and very beautiful.

205. *To make linseed oil.*—Take one quart of clean and pure linseed, damp it a little and then put it into a vase over the fire and stir it up with a spoon, and then push the spoon several times to the bottom so as to moisten all the seeds. You must add a little water in order to soften them; then put the seeds into a strong woollen cloth, place it in the press, and the oil will flow out.

206. *To make liquid varnish.*—Take of the gum of the juniper [sandarac], two parts, and one part of linseed oil, boil them together over a slow fire, and if the varnish appears to you to be too stiff, add more of the oil and take care not to let it catch fire, because you would not be able to extinguish it, and even if you could extinguish it, the varnish would be dark and unsightly. Let it boil for half an hour, and it will be done.

207. *To make liquid varnish in another manner.*—Take 1 lb. of linseed oil, and put it into a new glazed jar, and then take $\frac{1}{2}$ a quarter [of an ounce?] of roche alum in powder, and an equal quantity of minium or vermilion ground fine, and $\frac{1}{2}$ oz. of incense also ground fine. Mix all these ingredients together and put them into the oil to boil, stirring it with a stick; and when the oil is boiling, as it is likely to run over, have another glazed jar ready, and put it by that which contains the oil, so as to catch the oil that runs over, in order that it may not run on the ground, and in this manner make it boil up 3 or 4 times, and each time pour back what has run over, on that which is boiling in the jar. Having done this, set fire to the oil on the right hand side with a lighted straw, and let the oil burn on the upper part, but so that the jar may not burn on

204. *Ad fatiendam quemdam aquam que est bona ad ponendum super figuris et altris miniis.*—Abeas oleum aloë oleum seminis lini et vernice liquida de unoquoque tantum et hoc fatias simul bulire et repone in ampulla et quando opus est unge figuras aut miniis dico ipsis desicatis et non ante et erunt lustre et pulcherrime.

205. *A fare olio de semj de lino.*—Pilglia uno quarto de semj de lino necta et pura et amachala uno poco poi la pone in uno vaso al foco et cum uno cochiaro la vienj mistando poi va piu volte in lo fondo del dito vaso cum lo ditto cochiaro et falli spatío che se li possa infondare la granatella et volse imborsarla cum uno poco daqua acio diventi morbida poi la mecte in panno de lana forte et polla ali frescoli et uscira fuora lolio.

206. *A fare vernice liquida.*—Tolli gomma de gineparo le doi parte et olio de semj de lino et fa bulire insiemj cum fuoco temperato et chiaro et se te pare esse troppo sodo et tu ce pone piu olio predicto et guarda che la fiamba non se li aprenda perche non lo poriste spingere et se purre lo spingesse viria negra et brutta et bolla per meza hora et sera facta.

207. *A fare vernici liquida per altro modo.*—Recipe libre j de olio de semj de lino et metilo in una pignatta nova vitriata poi tolli mezo quarto de alumj de rocho spolverizato et altrettanto minio o cinabrio subtili macinato et meza oncia de incenso bene trito poi mista omne cosa insiemj et ponile in lo dito olio a bulire insiemj mistando cum uno bachelto et quando lolio ha lo bollo per volere prosperare de fora habi aparichiata una altra pignata vitriata et metila apresso quella de lolio per modo che quello che se spande vada in l'altra pignatta acio che lolio non se spanda in terra et in quello modo fa levare el bollore 3 o 4 volte disopra et ongj volta retornà quello che va disopra in su quella disocto che bolle facto questo acende lolio de lo lato dextro cum una paglia apresso de essa ma lassa ardare lolio uno poco dal canto disopra per modo che la pig-

the inside, on account of the too great heat, for otherwise the oil would smell unpleasantly. When you light the oil with the straw, remove the jar from the fire, and let it burn while you can say three paternosters, then extinguish the oil with a wooden cover, putting it upon the jar, and when it is extinguished, remove the cover in order to let the vapour escape. Then put it back over the fire; do this 3 times, and it is done.

208. *To purify ceruse.*—Take ceruse, put it into a clean jar, which should be placed over the fire, stir the ceruse continually with a stick, and it will become white.

209. *To make a pigment from the shavings of cloth, of the same colour as the cloth.*—Take quicklime and baked ashes, of each equal quantities, and make a caustic ley; take the ley, clean and clear, put it into a clean vase, and make it boil, and when it boils add to it the clippings of cloth of what colour soever you like, and, after it has boiled down to one-third, add to it a little roche alum at discretion; then strain it and put it to dry on a clean tile or upon a table, and spread it out, and when nearly dry, cut it in pieces as you like, and it is done.

210. *To make a water for painting on linen cloth or silk.*—Take 2 oz. of sal-ammoniac, 2 oz. of salgem, 1 oz. of saltpetre, pound the whole together, and then distil it, and keep the water until you need it; you may paint on whatever cloth you like.

211. *To make a yellow water for drawing and painting on linen or woollen.*—Take of roche alum 1 oz., of saffron 2 oz., and a little ley, and boil all these things together till reduced by one-third, and it is done.

212. *Glue for making any mould you like for casting figures.*—Take Armenian bole, flour, and clear water, and knead them together until they form a rather stiff paste; model what you like with it. Sulphur will do equally well, it only requires melting.

213. *To make gesso sottile.*—Take gesso and soak it in a vase so that the water may cover the gesso; mix and stir it up

nata non arda de dentro per troppo caldo altramente lolio puzaria. Et quando tu acendj lolio cum la paglia remove la pignata dal fuoco et lassa ardare tanto che tu diche 3 patri nostri poi aramorta lolio cum uno coverchio de ligno et mitilo sopra ala pignata et aramorto che le remove lo coperchio per che el fumj escha fora poi ritornalo al foco poi cosi farai 3 volte et sera fatta.

208. *Ad purgandam cerusam.*—Ahbeas cerusam et eam pone in ollam mundam et mictè super ignem semper movendo cum baculo dictam cerusam et efficitur alba.

209. *Ad fatiendum colorem de cimatura panorum cujus coloris erit talem colorem habebis.*—Piglia calcina viva et cenera recocta tanto de luna quanto de laltra et fa lisia per capitello et tolli la liscia necta et bella poi la pone in uno vaso necto et fa bullire et commo bullj mectice la cimatura de que colore che tu volj e quando haverà bulito tanto che sia reentrata per terzo et tu ce pone uno poco de alumj de rocho a tua discretione poi la cola et polla a sciugare in una tegola pollita o vero in una tavola et distendila et quando sera quasi sciuta fannj li pezj a tuo piacere e de facto.

210. *A fare aqua da dipingere in panno de lino o de seta.*—Ahvj onçe 2 de sale armoniaco onçe 2 de sale gemmo onçe j. de sal nitrio et pista omne cosa insiemj poi le metti alambichare et serba laqua al bisogno et porai dipingere suso omne panno che tu volj.

211. *A fare aqua gialla da disignare et dipingere in panno de lino o de lana.*—Tolli alumj de rocho onçe j zafaramj 2 et uno poco de liscia et fa bolire queste cose insiemj quanto che callj per terzo e de facto.

212. *Colla da fare omne forma che tu voli per gietare figure.*—Havj bolarminio fiore de farina cum aqua chiara et incorpora tanto che sia durezza et fa che forma tu volj. Et ancora el solphano fa quello medesimo et sia solo disfatto.

213. *A fare gesso succili.*—Piglia la chivarda del gesso lucido et metila a mollo in uno vaso sicche laqua stia disopra al

3 or 4 times every day, and at the end of 5 days take a strainer and strain off the water; and if you grind it, it will be finer. Then make it into cakes, and put them upon new tiles or bricks to dry; then put them away, and take care to preserve them from dust and dirt, and it will be fine gesso sottile.

214. *To make a window of goat-skin parchment which will appear to be real glass.*—Take the skin of a kid or a sheep or a goat, macerate it, remove the hair without lime, and scrape it very fine; then take a drachm of clean and clarified honey, mix it with 8 or 10 whites of eggs well beaten together with the honey in the same way as white of egg is beaten up for vermilion. Put the skin to soak in the white of egg and honey, squeeze it with your hand while in the composition, and let it remain in soak for 2 or 3 hours at the most; then take it out and stretch it well on a frame, and let it dry. Then paint upon it what you please, and let the colours dry well. Afterwards varnish it on one side, that is, on the side on which the colours are, and dry it in moderate sunshine, and it will appear like glass.

215. *For the same in another way.*—Take kid or sheep-skin parchment, scraped very fine, wet it with warm water; then stretch it on a frame, and let it dry; afterwards paint upon it, and again let it dry. Then take rather warm linseed-oil, and rub it over the parchment, and let that dry also, and it will resemble glass in appearance.

216. *To do the same with linen cloth.*—Take a linen cloth, very clean and close, and stretch it out well upon a frame; then take white of egg well whipped, separate it from the scum, and add to it one-third part of gum-water. Then lay it over the cloth with a sponge, so as to soak the cloth with it all over, and let it dry, and then paint upon it in any manner you like, and let that dry also; then give it another coat of the white of egg and gum-water, and let it dry again. Afterwards apply a coat of liquid varnish, and it will appear like crystal.

gesso et miscola molto bene omne di 3 o 4 volte et in capo de 5 di tolli una stacia et cola fora laqua et se tu la triti sera piu subtili de poi fanne pagnetti et mectile sopra coppì novi o vero matone acio che se sciugano poi la ripone et fino che se sciugano guarda non vi vada polvere ne altra bructura et sera bello gesso subtili.

214. *A fare una finestra de carta caprina che parera vetrio naturali.*—Tolli una pelle de capretto o montone o duna capra et macirala et de pela la sezna [senza?] calcina et radila subtilissimamente poi tolli una dragma de mele spumato et necto et mista lo cum octo o x chiara dove bene dibatuti insiemj cum lo mele ad modo se dibacte la chiara per lo cinabrio, poi mecti la dita pelle a mollo in la dicta chiara et mele et spremila cum mano in la dicta compositione et poi la lassa stare a molle in la ditta chiara per doi o tre hore al piu poi la tira fora et apicala bene stesta ad uno telaro et lassala sciugare et fa che la sia bene tirata poi la dipenge commo te piace et lassa sciugare bene li colori poi la invernica da uno lato cioe da lo lato de li colore et polla a sciugare al sole temperato et aparera de vetrio.

215. *Ad idem per aliam formam.*—Ahvvi carta de capretto o montone rasa subtilmente et bagnala in aqua tepida poi la stende insuso lo telaro et lassa sciugare poi la dipenge et lassa sciugare poi tolli olio de semj de lino uno poco caldo et dallo disopra ad ala dita carta et lassa sciugare et sera commo vetrio in aparentia.

216. *Ad idem in panno lini.*—Havvi panno de lino bene polito et fitto et pollo in su lo telaro bene tirato et steso poi tolli chiara dove ben dibatuta poi seperala dala schiuma et mistace per lo terzo de aqua de gomma poi la da sopra alo dito panno cum una spongia tanto che lo panno sia ben trapassato per tucto et lassa sciugare poi la dipenge cum gliochi o commo voj et lassa sciugare poi li da una altra mano de la dita chiara et aqua gommata et lassa sciugare poi li da la virnice liquida et sera commo christo vetrio.

217. *To make a water for cutting glass.*—Take vitriol, which comes upon the walls, and make a distilled water from it, and keep it in a vessel well closed. Then take Roman vitriol and pound it well, distil it, and keep the water also in a close vessel; then take sal-ammoniac and distil it, and keep this also. When you want to use the liquor, take equal quantities of each of these waters, mix them together, and draw with the mixed liquor upon the glass, and it will be cut exactly as you like wherever it is wetted with this water. And also, if you wish to cut glass, or to make small mirrors out of large ones, take a fine diamond, and draw upon the mirror with the point of the diamond, and immediately put the glass into water, and it will break directly by tapping the glass dexterously wherever you have touched it with the diamond.

218. *To make an earth for casting any fine thing.*—Take of potter's clay sifted fine 20 parts, and of common salt 1 part, then take $\frac{1}{2}$ a bocale of water, boil it, and dissolve the salt in it, let it cool, and make the clay into a paste with the salt and water, and work the mass into a cake; set it to bake until it becomes red like fire, then pound and work it again with the salt water. Next take the thing which you wish to cast or mould, and lay it on something smooth and polished, and take a hoop, and put into it the thing which you wish to mould, and then lay the earth upon it, and press it down well, let it dry over a slow fire, and cast it according to your fancy, and it will be fine and clear.

219. *To make a paste for modelling that will withstand the fire.*—Take scales of iron and pumice-stone and pound well together, then make them into a paste with white of egg well beaten up, and model whatever you like with it. Let it dry slowly, and it will become very hard and will stand fire.

220. *To make a paste with which you can do both good and evil, and can seal and unseal any letter, and can model whatever you like, and which will become very hard after you have moulded it, if you suffer it to dry, and to which you may give whatever colour you please.*—Take gum-tragacanth and gum-

217. *A fare aqua da tagliare el vetrio.*—Tolli vitriolo che nasce per le mura et fanne aqua a lambico et serbala bene turata poi tolli vitriolo romano et pistalo bene et fanne aqua a lambico et serbala bene turata poi tolli sale armoniaco et fanne aqua alo lambico et serbala bene et quando la voraj operare tolli de le ditte aque de omne una tanto et mistale insiemj et disegna lo vetrio cum dita aqua et tagliarasse dove sera bagnato cum dita aqua a tuo piacere. Et ancora se tu volesse taligliare vetrij o spechj grandi farli picolj tolli uno diamante fino et disegna cum la punta de lo dito diamante in su lo specchio et subito lo mecte in aqua et erompirasse subito percotendo lo vetrio dextramente dovj tu haverai tochco cum lo diamante.

218. *A fare una terra da gietare omne sottili cosa.*—Recipe terra da fare pignatti staciata subtili parte 20 sale comuno parte una poi tolli mezo bocale daqua et falla bulire poi ce pone quello sale a disfare poi lassa fredare poi impasta la terra cum la dicta aqua salata et fannj pane et metila a cociare tanto che tornano rossi ad modo foco poi la strita et stacjala de novo et impastala de novo cum la dita aqua salata poi tolli la cosa che tu voli gettare o formare et metila in loco pollito et piano et tollj uno cerchiello et mecti dentro la cosa che tu voli formare poi mecti suso la dicta terra et calcala bene poi la lassa seccare a lento foco poi gieta la tua fantasia et virà necta et bella.

219. *A fare pasta da impromptare che aresta a foco.*—Tolli schaglie de ferro et pumice et pista bene omne cosa insiemj poi impasta cum chiara dova bene dibattuta poi imprompta quello che tu voli et lassa seccare adagio e diventera durissima et arestara a foco.

220. *A fare pasta cum la quale poi fare el bene et el male et poi disigillare et sigillare omne lettera et poi impromptare quello te piace diventera durissima poi che averai impromptato et poi farla venire de quello colore che tu voli ponendola a sechare.*—Piglia gomma draganti et gommarabico ana et mecti tuctj

arabic, of each equal quantities, and steep them in sufficient water to cover them for 20 hours ; then pound them very fine in a mortar. Next take 1 lb. of white lead to each ounce of the gums, and mix the whole together like dough ; and, if you wish to have the paste white, do not add anything more to it. If you wish to have it of any other colour, mix with it whatever colour you like in fine powder, and work the ingredients well together, in order that they may be thoroughly incorporated one with another. Then anoint your hands with castor-oil, or linseed-oil, or oil of bitter almonds, and take this paste, and knead it very well in your hands ; and when you have kneaded it well, you can impress whatever you choose upon it. If you wish the paste to remain soft, put it into a cabbage-leaf, and it will remain soft for as long a period as you like.

221. *To make musk soap.*—Take a vase of whatever size you like, made of good earth, and let it be rather thick in order that the weight of the lime may not break it, and near the bottom of it there must be a hole, closed with a peg, and on the inside, in front of the hole, you must put a wooden platter, and upon the platter you must put a lump of tow, enough to cover the bottom of the jar, and upon the tow, in front of the hole, put a small piece of thin linen. Then mix two parts of ashes from the baths with one part of quicklime, and place the mass upon the piece of linen that is upon the tow in the vase, and spread it well all over it. Then take rain-water, according to the quantity of the ashes, and pour it into the vase at two or three times, because it boils up and absorbs the water, and there must be enough water to cover the ashes to the depth of two fingers'-breadth or less, and when it ceases to boil, let it stand for a whole night, and in the morning take out the peg and let out the ley ; and when you have drawn off a bocale full of it, pour it back into the vase, and it will become rather thick ; do this two or three times, and the last time let it rest a little, and then strain it ; and if it comes away too fast, press the ashes down a little in the vase, because it must issue from the whole like a thread in order that the ley may

queste cose in tanta aqua che stiano a molli per 20 hore poi pistale bene in uno mortaro che siano bene piste poi tolli lb. j. de biacha per omne oncia de le dicte gomme et incorpora omne cosa insiemj commo pasta. Et se tu la voj canida et bianca non ce metare piu niente. Et se tu la volesci daltro colore collorita mistace quello colore che te piace bene subtili et mista bene acio se incorporano luno cum laltro et poi te unge le mano cum olio de riciuta [ricino?] o olio de semj de lino o olio de amandole amare poi piglia questa pasta et menala molto bene intra le mano et commo e bene menata porai impromptare quello te piace. Et quando la volesse mantinere liquida dicta pasta mectila in una foglia de colo et sempre stara morbida per omne tempo.

221. *A fare sapone moschato.*—Habbi uno vaso de la capacita che tu voj facto di bona terra et sia ben grosso a cio la possanza de la calcina non lo rompa et apresso del fondo vole esser uno bugio el quale se conviene serrare cum uno spinello e dal canto dentro nante el bugio se vole metarce uno tagliere et sopra al tagliere se vole metarce una faldella de capecio che copra el fondo del vaso et sopra el capecio nante al bugio mectice uno poco de peza rada poi tolli doi parte de cenera de bagno et una parte de calcina viva poi la incorpora cum la cenere poi la pone sopra a la peza che e sopra al capecio in lo vaso et distendila bene per tutto poi tolli aqua pioviana secondo secondo che e la cenera et mectila in el vaso in doi o 3 fiata per che ella bolle et rescuigase et vole esser tanta aqua che stia sopra ala cenera doi deta o manco et quando non bolle piu lassa stare cusi tucta una nocte et la matina cavala spinella et lassa colare el capitello et quando naj cavato uno bocale remitilo disopra al vaso et vira uno poco brutto et questo fa doi o tre volte et lultima volta lassa uno poco reposare poi lassa colare et se venisse troppo forte calca uno poco la cenera del vaso perche la spinella vole gietare a filo acio che lo capitello vengna netto e bello poi che lo capitello e tutto vinuto che la cenera sia senza aqua tollj

run off clear. And when the ley has entirely run off so that the ashes remain dry, take half a jug of water, and pour it over the ashes in the vase, and when it is strained pour it back 3 or 4 times into the vase, and the last time draw off the ley clear. And if you wish to know whether the ley is properly made, put a fresh egg in it; if the egg goes to the bottom it is not good, and if the egg floats it is good. Then take 9 bocali of this ley, and one roll of deer's or cow's tallow, which makes lb. 2 oz. 9, and melt it well over the fire; and when it is well boiled pour it into this ley, and keep stirring it for the space of half an hour; then let it rest for a night or more, and if you wish to add musk or any other scent to it, reduce it to a fine powder, and add it to the tallow which is in the ley, mix it up well and let it settle. Then put the soap in the sun in order that it may refine itself better, and it will harden so that you may make it up into balls, and it is done.

222. *To make good camphor.*¹—Take 1 lb. of mastic, and steep it in two pounds of distilled vinegar, and put it in a round flask, and place it in dung for 3 days; afterwards place it in the sun, and close up the mouth of it, to exclude the rain, for thirty days in summer, and you will find a congealed mass, and will have very fine camphor.

223. *To make Alexandrine borax.*²—Take roche alum, and make it into pieces of about $\frac{1}{2}$ an oz. each, and then put them into a glazed jar, and pour some milk over them so that the milk may cover the alum by two fingers' breadths, and each day change the milk for 8 days, or until you find it mild to the taste. Then take beef-marrow and an equal quantity of oil of

¹ D. Alessio also gives a recipe for making factitious Camphor (Part II. p. 43), which he says was almost as good as that which was brought from Constantinople.

² It appears that two kinds of Borax were in use, the natural and the factitious; the former was brought from Alexandria, whence its name. D. Alessio (Part I. p. 129, 130) describes different modes of imitating it, among which is that mentioned in the text. According to this writer, borax was used in medicine, and in cementing gold.

- meza brocha daqua et metila sopra ala cenera che e in lo vaso et colata che sera remectila 3 o 4 volte suso in lo vaso et lultima volta recoglie el capitello chiaro. Et se voj sapere quando lo capitello e facto fino se conosce in questo modo tiene uno ovo fresco desopra se lovo va al fondo non e fino et se sta a galla e fino. De poi tolli 9 bocali de questo capitello et uno rotulo de sego de cervo o de vacha che sonno libre 2, 2 [oz. ?] nove e fallo bene strugiare al foco et bene bolito metarlo in questo capitello et sempre remenalo per spatio de meza hora poi lo lassa passare una notte o piu et se tu ce volj metere musco o altre cose odirifare pulverizale bene subtili et metili sopra al sego che e in lo capitello et misticalo bene de vantaggio poi lo pone a riposare poi lo pone al sole acio che se afina meglio et restringerasse per modo che lo porai a palotare e de facto.

222. *A fare la camphora bona.*—Tollj libram unam masticis et pone in duabus libris aceti stillati et pone in palla rotunda clausa sub fimo per tres dies postea pone ad solem et obtura bene ejus os propter pluvias in estate per triginta dies et invenies massam congelatam et habebis camphoram nobilissimam.

223. *A fare borace alixandrina.*—Recipe alumj de rocho et fannj pezuoli de meza oncia luno o circha poi li pone in una pignatta vitriata poi li pone desopra de lo lacte tanto che lo lacte avanza desopra alalumj doi deta et omne di li rimuta el lacte per infino a octo di tanto che tu veghi a la lingua che te paia dolce poi tolli merolli de ossa de bovi et altratanto

It was also used in reducing or fluxing metals and nielli, and by ladies as a cosmetic to whiten, soften, and cleanse the skin. Alexis does not allude in the most distant manner to the use of Borax in painting; and he appears so well informed on the subject, that it is scarcely probable that he should have been unacquainted with the fact, if it had been so used. The real Alexandrine Borax is mentioned in No. 269, where it is used as a flux in gilding on glass.

almonds, melt them in a pipkin, and then strain them and pour them into the jar with the alum and milk, and let the oil and marrow cover it by three fingers' breadths. Then put it into the sun for three months, that is to say, June, July, and August, and take care that neither rain nor dust falls into it, and it is done.

224. *To prepare vermilion for using with the paint-brush, and as a body colour.*—Take of vermilion whatever quantity you like, and grind it dry to a fine powder on marble or porphyry, and afterwards grind it with clear water, or with ley, until the powder is very fine and almost impalpable; let it dry upon the marble and put it into a horn, and wash it very well with clear and strong ley until it is very clean, and afterwards wash it again with fresh water until you think that the ley is well washed out of it; then suffer it to become nearly dry and wash it again with hot water and let it settle, and when nearly dry add to it some white of egg prepared with saffron and with twigs of fig-trees ground up, and make it liquid enough to flow well in the pen while writing. And if you wish it to use in body, put a little yolk of egg along with the white. And if you wish it for writing or making flowers, do not add the yolk of egg to it, and that it may be without froth or gloss add a little ear-wax to it; if too glossy, throw away that white of egg, and put some fresh to it without saffron or ear-wax; if it hardens so as not to flow in the pen add to it two drops of rose-water. And if you wish the white of egg not to smell, add to it (that is, to the white of egg) a little realgar (red orpiment) or camphor.

225. *To prepare azure to use as a body colour, and to use with the pen.*—Take the azure and put it into a glazed saucer, and then add some clean honey to it, and incorporate them well together; grind the honey with the azure upon marble, and the more it is ground the finer and better it will be. Then put it back into that saucer and wash it with warm water, until the water runs off clear; then wash it with cold water, and between each washing let the azure sink to the bottom, and continue to

olio damangdole et metile in una pignatta a disfare et poi le cola et mettile disopra a la ditta pignatta de lo alumj et lacte et fa che lo dito olio et merolle sopra avanzano 3 deta poi la pone al sole per 3 mesi cioe giugno, luglio et agosto et guarda non li piuova ne vada polvere e fatta.

224. *A preparare il cinabrio per adoperare a penna et fare corpi.*—Piglia del cinabrio la quantita che voj et macinalo molto bene asciutto in marmo o in porfido et poi lo macina cum aqua chiara o vero cum ranno da capo quanto sia bene subtile quasi senza tatto et lassalo seccare in su lo marmo poi lo metti in lo cornetto et lavallo molto bene cum ranno chiaro et forte tanto che sia bene netto poi de novo el lava cum aqua chiara tanto che tu crede che ne sia bene uscito quello ranno poi el lassa quasi seccare poi lo lava de novo cum aqua calda et lassalo posare et quasi secare poi metice sopra chiara dove preparata con zaferamj et cum rami de fico triti et fallo tanto liquido che scorgha bene per la penna scrivendo. Et se tu el voli per fare corpi metice uno poco de rosso de ovo insiemj cum la chiara. Et se tu el voli per scrivere o fiorirj non ce metare lo rosso del ovo. Et per farlo che non faccia schiuma et lustro metice uno poco de scarcatura de orecchie et se fusse troppo lustro gietta via quella chiara et metice de la nova dove non sia zafaramj ne brutura de orecchie et se se indurasse che non scorisse per la penna metice doi gocie daqua rosa. Et se volesi che la chiara non puza metice dentro uno poco de risa gallo o de canfora et cioe in la chiara.

225. *A preperare azurro per fare corpi et per adoperare a penna.*—Accipe lo azurro et metila in una scudella vitriata poi ce metti del mele bene netto et incorpora bene insiemj poi macina lo mele cum lo azurro sopra marmo e tanto piu sera macinato tanto vira piu fino et migliore poi lo remetti in quella scudella et lavallo cum aqua tepida tanto che laqua nescha chiara poi lo lava cum aqua fresca et da luna volta alaltra lassa andare lo azurro al fondo et tanto continua che sia bene

do so until it is well washed and purified. Then let the azure dry, and soak it in clean and strong ley in a glass vase, such as a drinking-glass, and let it stand for the space of 7 days; each day change the ley, and then add some fresh to it, and let it dry in the shade in a place free from dust. And if you wish to use it as a body colour, distemper it with parchment-size, or with size made from clippings of white chamois leather, and it will do well. And if you wish to use it with a pen or for miniatures, distemper it with gum-water and with prepared white of egg, and it will do well.

226. *To prepare white lead for painting.*—Take the white lead, and wash it several times in hot water, and then take two grains of clear gum-arabic and 3 grains of white incense, grind them very well with a little clear water, and then add the washed white lead, and grind the whole together, and collect it and add to it as much gum-water as you think it will bear, and if it is too hard put a little fresh water to it, and it will do well.

227. *To prepare verdigris for painting.*—Take verdigris and grind it well with very strong vinegar, and then make a hollow in a new brick, and put the verdigris into the hollow, until the brick has soaked up the vinegar, and do this 3 or 4 times, each time grinding up the verdigris with the vinegar afresh. Then take a little gum arabic, and grind it up together, and if you wish it lighter, add a little giallolino to it, and it will be well coloured.

228. *To prepare orpiment for using as a body colour.*—Take orpiment, and grind it dry, and know that it is hard to grind. In order to grind it quickly, grind some glass with it, and it will grind quickly, and, when it is well ground, distemper it with gum water and yolk of egg.

229. *To make gum water.*—Take clear water in a glass cup with gum arabic in powder and make it rather warm over the fire until it is well liquefied, and then keep it in a phial and use it.

230. *To temper prasminum.*—Take prasminum, grind it

lavato et purificato poi lassa sciugare lo azurro poi lo metti a mollo in ranno da capo netto et forte in uno vaso de vetro commo e uno bchiere et lassalo stare per spatio de 7 di et omne di li muta el ranno poi ce meti del novo poi lo lava cum aqua frescha et lassalo sciugare alombra in loco che non vi vada polvere. Et se tu el voli adoperare per fare corpi distemperalo cum colla de carta caprina o vero colla de ritalglie de camoscio bianco scamosciato et stara bene. Et se tu el voli per operare a penna o per minii distemperalo cum aqua gommata et cum chiara dovo preparata et stara bene.

226. *A preperare la biacha per dipengiare.*—Tolli la biacha et lavala piu volte cum aqua calda poi tolli doi granelli de gomarabico chiaro et 3 granelli de incenso bianco et macinali molto bene cum uno poco daqua chiara poi ce metti la biacha lavata et macina omne cosa insiemj poi la raccogli et metice tanta aqua gommata quanto te pare che comporta et se fusse troppo dura metice uno poco daqua chiara et stara bene.

227. *A preperare il verderamo per dipengiare.*—Havvi verderamo et macinalo cum fortissimo aceto multo bene poi lo pone poi fa uno cavo in uno matone novo et pone el dito verderamo in dito concavo per infino a tanto che lo matone haverà surbito quello aceto et cusi continua 3. o 4 volte omne volta remacinando lo verderamo cum lo aceto poi tollj uno poco de gommarabico et macina insiemj et se tu lo volesci piu chiaro macinace uno poco de zalulino et congrue colorabitur.

228. *A preperare loropiumento per fare corpi.*—Tolli oropiumento et macinalo dasuto et sappi che e duro a macinarlo per macinarlo presto macinace insiemj cum esso del vetro et macinarasse presto et commo e bene macinato distempera cum aqua gomata et trolo dovo rosso.

229. *A faciendum aquam gummatam.*—Summe aquam claram in ciato vitrij cum gummarabico triturato et fac aliquantulum calefacere ad ignem donec sit bene liquefactum deinde serva in ampulla et utere.

230. *Ad distemperandum prasminum.*—Accipe prasminum

with pure water, and let it dry, and when you wish to use it, temper it with gum water, and if you wish to have it lighter, add some orpiment to it, and it will be well coloured.

231. *To temper minium.*—Take minium and grind it with pure water, and put it into a vase, and when it is settled, separate the water well, and temper it with gum water.

232. *To temper giallolino.*—Take of giallolino whatever quantity you like and grind it on porphyry very fine with fresh □, and then let it dry. Then grind it again with clear water, and let it dry, and then temper it with gum water and a little yolk of egg.

233. *To temper the rossetta.*—Take the rossetta and grind it well with gum water, and it will become hard like the other colours. When it is hard, temper it with fresh water.

234. *To prepare saffron.*—Take saffron, and soak it in a shell with prepared white of egg for 3 hours, and it will be a fine yellow.

235. *To temper lake to use in ¹body.*—Take the lake and grind it in gum water with 2 or 3 grains of white and clear incense, and when it is hard, temper it with fresh water.

236. *To prepare the earths for painting on walls or on mortar.*—Know that you must first grind red earth, and green earth, and every other earth for painting on walls, dry, afterwards very finely with clear water, then let the colour dry, and temper it with very strong gum water, or with egg, that is to say, with the yolk and white mixed and well beaten up together, and with fig wood cut small into the white of egg, and with this vehicle temper any letters, and they will look well.

237. *To lay flat tints and make [ornamental] foliage.*—If you wish to make foliage, lay on a flat tint of what colour you like, and let it dry very well. If you lay a flat tint of green, use the pezzette made from the blue lily¹ for the shade, and giallolino for the light. If you lay a flat tint of azure, use the

¹ See ante, Nos. 92 and 125.

et eum tere cum pura aqua et permitte sicarj et cum vis operare tempera cum aqua gummata et si vis eum magis clarum pone cum eo de auropiumento et congrue colorabitur.

231. *Ad distemperandum minium.*—Habeas minium et tere cum aqua pura et mitte in vase et cum resederit sepera aquam optime deinde tempera cum aqua gummata.

232. *A distemperare el zallulino.*—Tolli del zallulino la quantita che voi et macinalo in porfido cum urina fresca subtilissimamente et poi lo lassa secare poi lo rimacina de nuovo cum aqua chiara et lassa secare et poi lo distempera cum aqua gummata et uno poco de rosso dovo.

233. *A distemperare la rossecta.*—Piglia de la rossecta et macinala bene cum aqua gummata et indopiasse commo li altri collore et quando e dura stemperala cum aqua chiara.

234. *A preparare el zafaramj.*—Abbi zafaramj et metilo in la tua cocia a mollo cum chiara preparata et lassala stare a molle per 3 hore et sera bello zallo.

235. *A distemperare lacha per fare corpi.*—Tolli la lacha et macinala cum aqua gommata et cum doi o tre granelli de incenso bianco et chiaro et quando se indurasse stemperala cum aqua chiara.

236. *A preparare le terre per adoperare in muro o in calcina.*—Sappi che la terra pagonaza et terra verde et omne terra da dipengiare in muro se macina prima da secco et poi cum aqua chiara molto subtilmente poi se lassa sechare poi se distempera cum aqua gommata ben tenace o vero cum lovo cioe chiara et rosso misto et dibatuto bene insiemj et cum lingno de fico sminuzato in lovo et cum esso distempera tucte lettere et stara bene.

237. *A campeggiare et fare fogliami.*—Se tu volj fare fogliami campeggia prima de quellj collore che tu volj et lassali sciucare bene de vantagio. Se tu campeggie de verde la pezola de lo giglio e lombra sua et el zallulino e lo suo relevo. Se tu campeggie de azurro lombra sua e la pezola pavonaza et la

purple pezzette for the shade, and white lead for the light. If you lay a flat tint of red, use verzino for the light.

238. *To make stones for rings, that is to say, precious gems clear and of a fine colour. And you may, in this way, quickly and easily, make pearls, rubies, and balas rubies which are artificial, and not natural.*—Take of the good stone which is called alabaster of Constantinople¹ as much as you like; first make it hot like iron and quench it in very strong white vinegar; afterwards grind it fine in a bronze mortar, and put the whole of it into linseed or olive oil, and let it remain for 3 days or more. Afterwards put it into a cucurbit, and distil it through an alembic, and collect and keep what comes over. And when you wish to colour it, put into that water whatever colour you like, and it will keep its colour for ever. So if you want to have a sapphire, put ultramarine azure into it. If you wish to have an emerald, put in some verdigris. If you wish to have a topaz, put in some oil from the yolks of hen's eggs and tin, and a certain water must be made by soaking the colour in it for 3 days with some alum zucarinio or scagliola, and then strain this coloured water through a fine and close linen cloth, and in the same manner do what you please. Then thicken it by the fire to the consistence of dough, and take some of that paste and cut it into whatever shape you like, a stone or a cup, or a vase, boiling it well with olive or linseed oil, or with oil of bitter almonds; dry it in a hot sun upon a polished board, and it will be like true and natural stone, and preserve this recipe as of great use and advantage.

239. *You may make in the following manner with crystal, painted and factitious stones, such as topazes, sapphires, &c.*²—Take 1 lb. of the best crystal, and grind it in a mortar and sift it, so that it may be in a very fine powder. Then add 5 lbs. of stag's bones, calcined to perfect whiteness, and if you cannot

¹ The Alabaster appears to supply the place of the pounded bricks used in the common process of distilling oil. The object of employing it was to equalize the heat and to economise time and fuel. It probably also prevented the danger of the oil boiling over.

biccha e el suo relevo. Se tu campeggie de rosso el suo relevo e el verzino.

238. *Ad lapides anullorum componendos scilicet gemmas pretiosas claras et laudabilis coloris. Et margaritas rubinos et balascios que sunt artificiales et non naturales poteris ita componere cito et facile.*—Recipe de bono lapide qui vocatur alabastrum constantinopolitanum quantum vis et illum primo ignias ut ignitum ferrum et extingue in acetum album acerrium postea tere in brumzi mortario subtiliter et totum pone in oleo lini vel olive ubi stet 3^{bus} diebus vel plus postea pone in cucurbita et stilla per elembicum cujus distillationem collige et conserva. Et cum autem vis collorare pone in ipsa aqua quem colorem vis et perpetue tenebit colorem. Nam si vis habere zafirrum intus pone azurum ultramarinum. Si vis habere smiralgdum intus ponem viridem herem. Si vis habere topatium intus pone oleum vittollorum ovorum gallinarum et π [stannum] quequidem aqua fiet cum interposito collore 3 diebus rasine aluminis zucarini vel scaioli deinde aquam coloratam cola per pannum lineum spissum et subtilem et idem fac quid vis. Nam congela juxta ignem ut veniat ad duritiem paste et de tali pasta tolle portionem et incide ad quam formam vis lapidem vel coppam sive vasem bene buliendo cum olive oleo vel oleo seminis lini aut oleo amangdolarum amarium in freventi sole ad desiccandum super asidem politam et erunt tamquam vere et naturales et hoc habeas pro magno dono ac utilitate.

239. *Sic fiunt de christallo lapides picti contrafacti ut topatii zafirri etc.*—Abeas libram j cristalli optimi et tere in mortario et cribra ut sit subtiliter pulverizati postea pone 5 libras ossum cervinum combustum usque ad albedinem perfectam si vero non poteris habere zervinum ossum habeas bovinum ossum sive

² This recipe somewhat resembles one in the Sloane MS., No. 3661, but in this last MS. it is said that the sapphire is to be imitated with "Azurro Ultramarino," while in the text "good azure" only is mentioned. See Theophilus, E. ed., p. 176.

have stag's bones, take beef bones or buffalo bones. Then take of sal alkali 5 lbs., grind it fine, and mix it all together, and put this powder in a strong covered jar, luted with lutum sapientiæ, and place it into a glass furnace where it may remain 5 or 7 days at the most, and melt it into glass there. Afterwards put some good azure upon it, and knead both up together, and a blue colour will be produced and you may make up small or large sapphires, which you may set with the stone called emerald. If you wish to have a topaz, add saffron. If you wish light rubies put vermilion, if dark, verzino. If pomegranate coloured put verzino or oricella or rose colour. If you wish jasper, put burnt orpiment; for what is made of glass, is made of crystal, as before.

240. *To make pearls.*—Take very clear crystal glass, and reduce it to as fine a powder as you can, and incorporate it with white of egg, and slime of snails, and with that paste make pearls in moulds, so that they may be round, perforate them with a hog's bristle, and then put them in a hollow vase over the fire, so that they may become white hot; then quench them in cold water, and they will be very beautiful.

241. *To make beautiful saucers of crystal.*—Calcine bright crystal or white marble stones, and then take 6 rotoli¹ of this very white calx, 2 rotoli of burnt tartar, and 1 rotolo of sal alkali; put them all into the glass furnace, and let them melt there, and you may make saucers and whatever you like, and they will be as beautiful as crystal; and if you paint them with saffron of Mars, and heat what you have painted at the fire, it will be like fine gold.

242. *To make rubies.*—Take of roche alum 2, 1, of saltpetre 3, 1, and reduce them to fine powder together; then take verzino boiled with wine till reduced one-half, and with this wine mix and knead up the said powders to the consistence of sauce; put them into a glass vase with a gentle fire, that the liquid

¹ Rotolo, a Venetian weight of about 32 oz.; also a Sicilian weight of 2½ lbs. But see No. 221, p. 499.

buffalinum deinde tolle salis alcali lb. 5 et subtiliter tere et commisce bene insimul et hunc pulverem pone in forti olla coperta et luto sapientie lutata et pone in formace vitrialorum ubi stet quinque diebus vel septem ad plus et illic fundatur vitrium postea superpone de bono azurro et insimul stempera et fiet color cilistrinus et conficias zafiros grossos vel parvos quos actabis cum petra que vocatur smiraglius. Si vis habere topatium pone desuper crocum. Si rubinos claros pone cinabrium. Si obscuros pone verzinum. Si granatas pone verzinum sive oricelle aut rose. Si iaspides pone exustum de auripiumento nam quod fit de vitro fit de crystallo ut predictum.

240. *Ad fatiendum margaritas.*—Accipe vitrum crystallinum lucidissimum et subtiliter pulveriza quantum potes et incorpora cum albumine ovj et spuma lumace et de illa massa forma perlas cum formis ut sit bene rotunda et perfora cum una seta porci deinde pone eas in uno vase cupo ad ignem tantum quod fiant albe postea extingue eas cum clara aqua et erunt pulcherrime.

241. *Ad fatiendum pulcras scutes de crystallo.*—Habeas lapides vivos crystallinos sive marmorinos albos et de ipsis fac calcina de quo vis deinde accipe de ista calcina albissima rodulos 6. tartari usti rodulos 2. et sal alcali rodulos unum et pone in fornace vitri et ibi fac fundere et poteris facere scutellas et quodcumque volueris et erunt pulcre ut cristallus et si pingis de croco ferri et calefatias ad ignem picturas erunt sicut aurum finum.

242. *Ad rubinos componendum.*—Tolle aluminis rocci 2. j. salis nitri 3. j. et pulveriza subtiliter insimul deinde accipe verzinum bulitum in vinum ad medium et cum dicto vino impasta et incorpora dictos pulveres ad modum saporis et pone in vase vitrio cum parvo igne ut siccetur et in unam massam reducetur

may evaporate, and that the whole may form one mass. Take it off the fire, and let it stand 7 days, and you will find a well-coloured substance like dough, mould it into any shape you please.

243. *To make balas rubies.*—Put a stone of pure crystal into a hollow iron ladle, and make a good fire under it. When the whole of the ladle, with the stone in it, is red hot, take clear and cold spring water, and throw a drop of it upon the stone, and afterwards put it back gently to the fire; then take dragon's blood in fine powder, make it into a lump, and anoint the stone, and put it back to the fire so that the ladle may get red hot with a little fire, and then remove it from the fire and let it cool near the fire, and when it is almost cool, rub it with a piece of very rough woollen cloth, and it will be well done.

244. *To make fine pearls, and of a good colour to all appearance.*—Take stones from the heads of fishes in fine powder, and incorporate the powder with white of egg to the consistence of dough, and then shape the pearls that they may be perfectly round; perforate them with a hog's bristle, and pass a horse-hair through the hole; then place them in the sun to dry. Then boil them in new milk, and let them cool in a place free from wind and dust until they become hard.

245. *To make pearls, which are just like natural pearls, and undoubtedly real and good.*—Take mother of pearl, or very fine pearls, or that shining matter which is in pearls' shells, pound it fine, and take two parts of this powder, and one part of very white powdered gum arabic, mix the whole with dew, and then make up the pearls into a good shape and dry them before the fire, and before they are quite hard perforate them with a hog's bristle, and then let them get very hard, and polish them gently with the tool with which the goldsmiths polish stones. Then take very white cheese and some milk of a fig-tree, and put the powdered cheese into that milk, and expose it to the open air in a clean vessel, and it will be dissolved. Then string your pearls on a horsehair or thread, warm them well before the fire,

et leva ab igne et dimicte stare per 7^m dies. et invenies mathe-
riam in modum paste bene coloratam et fac aut forma quid vis
ad libitum.

243. *Ad fatiendum balascios.*—Accipe lapidem cristalli puri
et habeas unam palectam ferri concavam et ea micte lapidem
et fac subtus ignem bonum et cum fuerit ignita tola palecta
cum lapide intus habeas claram et frigidam aquam surgentem
et proice unam guctam super dictum lapidem postea suaviter
repone ad ignem et habeas sanguinem draconis finum pulveriza-
tum subtiliter et fatias ex eo unam maxam et unge lapidem et
remite ad ignem ut palecta veniat rubea cum parvo igne deinde
elleva ad igne et permicte frigidarj justa ignem et cum fuerit
quasi frigida frica eam cum pettia panni lini acerrimj et bene
erit factum.

244. *Ad fatiendum pulcras perlas tamquam et laudabilis coloris
in aparentia.*—Habeas lapides pisscium de capitibus pulverri-
zatos suctiliter et incorpora cum albumine ovj ut pasta forma
postea et fac ut sit bene rotunda post perfora cum seta porci per
quod foramen pone setam equi et dimitte ut ad solem siccentur
demum quoque eas in lacte recenti et dimicte fridare in loco
sine vento et pulvere donec in duritiem convertantur.

245. *Ad fatiendum margaritas sive perlas tanquam naturales
et optimas et veras sine dubio.*—Summe matrem perle sive perlas
minutissimas aut lucidum illud quod est in conchiliis perlarum
et pulveriza subtilissime et de eo pulvere acipe partes duas et
partem unam albissimam gummam arabicam pulverizatam et
misce cum aqua roris demum informa optime et desicca ad
humbram et antequam multum indurescant perfora cum seta
porcina et dimitte fortiter durescere postea poli plane cum quo
poliunt aurifices lapides postea acipe casum albissimum et lac
fici et pone in eo lacte ditum casum pulverizatam et dimicte ad
serenum in vasculo mundo et disolvetur postea micte perlas tuas
in seta caballi aut in filo et calefac bene eas ad ignem postea
merge eas in tali disolutione et eleva et dimitte sicari demum

dip them into this solution, and take them out and let them dry, and then warm the solution. Dip the pearls in it and dry them, and repeat the process until you have very bright pearls ; then bury them in barley meal for 2 hours, and rub them well with a cloth. And a certain Spaniard¹ told me that I might dissolve them in lemon juice, and dry the powder, and make up the pearls with snails' slime, so as to be like dough. Then shape them, and take a piece of stale and tender beef, cut it open, and, making holes in the meat, put each pearl into a separate hole, and join the pieces together, and tie them well lest the vapour of the pearls should escape, and bake them in the oven until the meat is well dressed for eating, and they will be good and perfect ; but if by chance the meat should be too much burnt for eating, give the pearls to a pigeon to swallow for a day or more, and they will then be very bright.

246. *To make large pearls out of small ones.*—Grind small pearls fine in a bronze mortar, and then take the juice of citrons, and filter it ; next take urine and spirit of turpentine, of each one-third part of the quantity of the citron juice, and knead up the powder with this water so that it may become like dough ; let it stand for 3 days in the sun, and afterwards knead it well together and put it upon glass, and make pearls just as you please with “oleo muscellino,”² and then perforate them with a hog's bristle, and pass a horsehair through the hole and leave them in the sun until they are dry. Then put them into the belly of a fish, having thrown away the inside, and bake it as if it were a pie ; then take out the pearls, and you will find them converted into hard stones. Rub them well in a linen cloth with barley meal, and they will be very bright.

247. *To clean pearls.*—Take pearls, and wash them well in clear water in a very clean cloth, and then take ultramarine soap,³ and dissolve it in water, and wash them as before.

¹ Probably Jacopo de Tholeto before mentioned.

² A composition of oil, water, spices, and odoriferous drugs. See Ricetario Fiorentino.

iterum calefac dictam disolutionem et sumerge et desica et sic tandiu reitera donec habeas perlas luccidissimas deinde sepelias eas in furfure ordeacio per duas horas et frica optime cum panno. Et quidam Ispanus dixit mihi ut eas in succo limonum solverem novem recottam et siccetur et cumglutinetur cum glutine limatii et sint sicut pasta et formentur postea accipe frustrum carnis veteri et macer tauri et divide frustrum et facta fovea in carne colloca singulas perlas in singulis foveis et reiunge carnes et liga perfecte ne vaporet fumus perlarum et infurno bene assa et sint bone ad comedendum et erunt bone et perfecte sed si forte erunt nimis aduste da comedere columbo per diem vel plus et erunt lucidissime.

246. *Ad fatiendum perlas grossas de minutis.*—Tere parvas margaritas in mortario brunzi subtiliter demum accipe citositatem citrorum et distilla per filtrum et de urina et de aqua rasi quantum est tertia pars aque citri et impasta dictum pulverem cum hac aqua ita quod deveniat sicut pasta et dimicte per tres dies ad solem postea cum glutina diligenter et depone super vitrum et forma margaritas ad libitum cum oleo muscellino postea perfora cum porcina seta per quod foramen pone setam equinam et dimite ad solem donec siccetur demum pone in ventre piscis bucefalij egeritis interioribus et sue sive cuscias ventrem et fac inde pastillum et quoque et extrage et invenies lapides duros. Et frica eas cum furfure ordei in panno fortiter demum da collumbo vel gallo comedere per diem j vel amplius sicut videtur et iterum frica cum furfure ut prius et erunt lucidissime.

247. *Ad margaritas sive perlas clarificandas.*—Accipe perlas et lava fortiter in aqua limpidissima in panno mundissimo et tunc acipe saponem ultramarinum et dissolve in aqua et lava ut supra.

³ Probably the Roman Soap, with which it was said in No. 4, that the Azurum Citramarinum was to be washed.

248. *To make an emerald of crystal.*—Take crystal, and soak it in alum for 12 days, and then cook it in verdigris, and it will be in appearance a fine emerald, like a real one. And so you may make a sapphire and all other precious stones according to the colour you add to the crystal, proceeding in the same manner as before, and you will have imitations of all the precious stones.

249. *To make a chrysolite with crystal.*—Take a crystal, and steep it in alum for 15 days; then cook it in orpiment, and it will appear a chrysolite.

250. *To make amber.*¹—Take burnt tartar, and make a ley with very strong vinegar, reduce it by boiling to one-half, strain it again through the burnt tartar, and let it settle and clear itself. Then take yolk of eggs for the red, and white of egg for the white, and beat them well, and let them stand for 3 days in the sun until they are decomposed; then put the vinegar with the eggs into a glass vase, place them near the fire, and make them boil, and for each egg put 2 [oz.], 5 [dr.] of spirit of wine and of honey; of tempered saffron, 3, 1; of myrrh, 3, 5; and of cherry gum, 3, 5. Strain all these things so prepared, boil them for an hour, and let them cool, and make amber [beads] just as you please; then pierce them with a hog's bristle, and afterwards anoint them with linseed oil, and at length, when they are dry, anoint them with liquid varnish, and they will be very beautiful.

251. *To make amber (beads).*—Take the whites of hen's eggs, and whip them with a sponge till they cease to froth; add a little roche alum, colophony well powdered, and some cherry gum. Strain the mixture through a cloth, and put it into a flask well closed and luted, and set the flask in a jar full of water; boil it for an hour, and then put it to cool in the open air, and dry it, and afterwards wrap it up in a linen cloth and bury it in dung for 3 days, and it will then be liquid, so that you may work it in your hands, and make beads and whatever you please. While you are modelling them, anoint your hands

¹ The value of amber at this time may be estimated by the numerous

248. *Ad fatiendum smiraldum de christallo.*—Habeas cristallum et mictē in allumine per dies duodecim postea quoque in viride ere et erit smiraldus nobilis in aparentia ut esset finum. Et sic poteris habere zafirrum et omnes lapides pretiosos secundum colorem quem vis mictere cristallum et fac in supradicto modo et habebis omnes lapides pretiosos contrafactos.

249. *Ad fatiendum crisolium de cristallo.*—Tolle cristallum et mictē in alumine per 15 dies demum quoque in auripiumento et apparebit crisolium.

250. *Ad fatiendum ambra.*—Accipe cinerem fetie et fac liscivium cum aceto albo fortissimo et deinde fac eum bullire per medium ut revertatur et iterum cola per dictum cinerem et fac eum quiescere ut sit bene clarum demum acipe ovorum vitella pro rubeis et albumina pro albis et percute bene et permittē per tres dies ad solem quiescere donec fiant putride deinde tolle dictum acetum cum dictis ovis in uno vaso vitrio et pone ad ignem et fac bullire et pro omni ovo mitte 2. 5. aque vite et mellis ana, et croci stemperati 3. j. mirre 3. 5. gumme cerasarum 3. 5. stringentur ea et omnia sic preparata fac bullire per unam horam et mictē frigidari et forma ambra ad libitum tuum et fora ea cum porcina seta et postea unge ea cum oleo seminj linj demum quando sunt sicce unge ea cum liquida vernice et permittē siccare et erunt pulcherrime.

251. *Ad ambra fatiendum.*—Tolle albumina ovorum gallinarum et cum spungia tantum perchute ne aliqua spuma appareat et mite aliquantulum aluminis rocci et colofonie optime pulverizate gume cerese et per pannum cola et pone in ampulla bene clausa et lutata et pone in olla aque plena et fac bulire per unam horam demum pone ad refrigidare ad serenum ut siccet postea involve in panno lineo et pone sub fimo per 3 dies postea erit liquida qua poteris ducere in manus et forma ambra et quicquid vis aliud et cum formaabis ea unge tuas manus comuni oleo et fora ea et pone ad siccandum et erunt facta.

recipes for imitating it. The use of this factitious amber appears to have been for making "beads for Paternosters," as it is expressed in No. 272.

with common oil, pierce the beads, and let them dry, and they will be done.

252. *For the same.*—Take white of eggs, beaten as if for distempering vermilion, and put it into a flask and boil it in very strong vinegar until it coagulates; then break the flask, and make beads of it.

253. *For the same purpose.*—Take arsenic in crystals¹ and roche alum finely pounded, of each equal quantities; distemper these ingredients with white of egg well whipped, and then put them into a very clean budello di castrone, which must be boiled until it becomes hard. When you wish to use it and soften it, boil the budello with white vinegar, and make the beads as you please. If you wish to make them yellow, add some saffron, and mix the ingredients well together in powder; then strain the powder through a linen cloth, and boil it as before directed. And if you wish the colour to be red, mix the white of egg used for vermilion with sandal-wood² in powder, and do as before directed. And if you wish the colour to be green, take verdigris, and mix it with white of egg, and do as before. And if you wish it to be blue, take azure, and do as before directed.

254. *For the same, as before.*—Take purified white of egg, coagulate it over a slow fire, and make beads of it; then let it dry in the sun, and you may make it of whatever colour you like by putting into it the colour which you wish to give it, but it must be coagulated in a round shape.

255. *To calcine crystal.*—Take small pieces of crystal of the size of chesnuts, wash them well, and dry them; put them in a reverberatory furnace, until they are red hot, then throw them into clear water. Do this 4 or 5 times, and then pound what was calcined; and in the same manner the emerald must be calcined.

¹ The method of preparing arsenic in crystals is thus described by Matthioli:—"Crystalled Arsenic, so called because it is transparent, like crystal, is not found native with orpiment, as my countryman Vannoccio writes in his Pyrotechnia; but is prepared artificially from pounded orpiment and salt, by heating and subliming them together in certain covered earthen

252. *Ad idem.*—Habeas albumen ovorum ruptum in modum ad temperandum cenabrium et mictre in ampulla ut impleatur et in aceto acerrimo fac bullire donec congeletur demum frange ampulla et forma ambra.

253. *Super eodem.*—Piglia arsenico cristallino alumi de roccho bene pisto ana et distempera queste cose cum chiara dova rucpta bene poi mecte queste cose in uno budello de castrone bene necto et fa bullire tanto che divente sodo et quando el vorai adoperare et indolcirlo fa bulire lo dicto budello cum aceto bianco poi forma limbra [lambra?] a tuo piacere. Se tu le voi fare gialli mistace del zafaramj et remista bene insiemj in polvere poi lo cola cum panno de lino et cocilo commo e dicto disopra et se lo voi rosce mista cum la chiara del cinabrio cum li sandoli in polvere et fa commo e disopra dicto. Et se lo voi verde tolli verderamo et mista cum chiara et fa commo disopra. Et se volesce azure tolli azurro et fa per lo modo sopra dicto.

254. *Ad idem ut supra.*—Habeas ovorum clara purificata et coagula lento igne et fac ambra postea dimite ipsum sicare ad solem et potes facere de quolibet colore vis colorare pone intus colorem sed formam rutundam debet coagulari.

255. *Ad calcinandum cristallum.*—Capias pecios christalli parvos ut castanea et ipsos bene lava et desica demum pone in igne reverberationis donec rubiscentur postea proice in aqua frigida et ita fac 4. vel 5 vicibus deinde pista quod calcinatum est. Et idem modo calcinabitur smiriglium.

vessels, made for the purpose; the arsenic sublimes and attaches itself to the covers, and becomes clear and transparent, especially in the centre." Matt. p. 1428.

* Sandali Rossi. The wood of the Pterocarpus Santalinus. It is used in dyeing, and for colouring varnishes.

256. *To prepare crystal.*—Take crystal, make it very hot, and quench it in cold water ; break it and reduce it to powder ; and when it is powdered, take 5 parts of the powder, 1 part of calcined tartar, and 1 part of sal-alkali ; melt them together until the tartar and sal-alkali are consumed, and then colour the glass with any colour you choose, if you think proper, and do what you choose with it.

257. *To make factitious crystal.*—Take the whites of 30 eggs, beaten to a froth, and $\frac{2}{3}$ of common salt, put them into a jar to boil till reduced to one-third ; then fill the jar again, and add of oil of chamomile¹ $\frac{2}{3}$.ij ; boil it again till it dries, and then set it by to cool. Make it into any form you please. With oil it will make amber, and without oil it will appear like crystal.

258. *To soften crystal.*—Take roche alum, and grind it well upon marble with very strong vinegar, then put it into a glazed vase, and make it boil until it is dry. Having done this, take it out and grind it again, and do this 5 times, and afterwards put it in a glass flask beneath dung until it is dissolved. Then throw away the supernatant water, and you may then give a colour to the crystal, and mould whatever you like.

259. *To imitate precious stones with crystal.*—Take roche alum, alum zucarino, Roman vitriol, and “salis copertum,” of each equal quantities, and put these ingredients into clear and strained ley, and dissolve them, and you may colour the crystal. For a sapphire, add azure ; for an emerald, add verdigris ; for a ruby, add vermilion ; for a balas ruby, add ver-zino or “stupio ;” for hyacinth, sky-blue and a little azure ; for amethyst, some oricella ; and so you may imitate all stones by adding different colours. Remember, however, that the crystal and the colours must be dissolved like colours and coagulated. Then boil them till they become like stones.

260. *To soften crystal previous to stamping or carving it like wax.*—Take fine crystal and put it to soak in the blood of a

¹ The old method of preparing this oil was by steeping chamomile flowers in olive oil, and exposing the bottle to the sun for 40 days. See Ricet-

256. *Ad fixandum cristallum.*—Tolle cristallum et calefatias eum valde fortiter et proice in aqua frigida et ipse frange et reduc in pulverem et eo pulverizato recipe de ipso partes 5 et partem j de tartaro calcinato et partem j de sale alcali et funde insimul donec tartarum et sal alcali consumentur et ibi colora ipsum de quo colore vis colorare si placet et fac de ipso opus tuum.

257. *Ad fatiendum christallum contrafactum.*—Habeas album triginta ovorum et $\frac{2}{3}$: 2. (*sic*) salis comunis et bene spumatum pone in ampulla ut bulliant donec reducatur ad tertium et iterum repleatur ampulla et in ea ponatur olei camomille $\frac{2}{3}$. ij (*sic*) et iterum buliatur ut desicetur et pone ad refrigidandum et forma quic vis cum oleo erunt ambra et sine oleo aparebit cristallum.

258. *Ad molificandum cristallum.*—Accipe aluminis rocj et tere bene super marmorem cum fortissimo aceto deinde pone in vase vitriato et fac bulire donec desicetur hoc facto extrahe et iterum tere et sic fac vicibus 5. postea pone in ampulla vitria sub fimo donec solveatur deinde aqua que supernatet proiciatur et tunc poteris dare collorem christallo et formare quicquid vis.

259. *Ad faciendum lapides pretiosos contrafactos de cristallo.*—Abeas aluminis rocce, aluminis zucarini, vitrioli romani, salis copertum ana et tere bene simul et pone in urina colata et clara et dimite ut dissolvitur et poteris colorare cristallum pro zafirro pone azurrum pro smiralgdo pone viridi es et pro rubino cinaprium pro balascio brasilem sive stupio pro iacinto celeste parum azurri pro amastito ex oricella et sic poteris habere omnes lapides ponendo colorem. Memento tamen quod cristallus et collores debent resolvi ad modum coloris et congelare deinde bulliant in modum lapidum.

260. *A molificare el cristallo primo che porai impromptare et tagliare commo cera.*—Recipe el cristallo fino et metilo a

tario Fiorentino, p. 248. At the present time a distilled oil is made from Chamomiles.

lamb, or of a calf fresh killed, and it will soon become soft, and when it is cold it will again become hard and shining as before.

261. *This is a hidden philosophical operation, that is to say, to make large corals out of small ones in this way.*—Take whatever quantity you like of the small seed corals, and pound them and pulverize them so as to be almost impalpable, and then take lemon-juice, well purified, as follows:—Take the juice and first strain it through a thick woollen cloth, and do this 3 or 4 times, and then filter it until it is perfectly clear, and knead up the powder with this juice in a glass vase; and, when well incorporated and soaked, let the juice cover the powder by two or three fingers' breadths, and then you will see that it will produce a certain creamy or thick liquor on the top of it. Take this and put it aside in a clean jar; then take the powders, and let them dry until they become as hard as stiff paste, and with this paste make large corals, or images, or horses, or figures, or branches of coral, or whatever you like, and put them into a place secure from dust, smoke, wind, and sun, and let them dry a little; and before they are quite dry, anoint them with that creamy liquor which you reserved; let them dry well and completely, and you will have a fine and polished and genuine work, which is of considerable profit.

262. *To make good liquid varnish.*—Take 2 lbs. of common oil, and 2 lbs. of fresh linseed, and boil them together in a glazed pipkin until it is reduced one-half, and then pour it into another glazed vase, such as a pipkin, and take a tripod and place the pipkin on it, and make a clear fire under it, and when the liquid begins to boil add to it 30 or 40 cloves of garlic, cleaned and scraped fine, and a little roche alum at discretion, and let it boil; and if you wish to know when it is well done, take a hen's feather and dip it in the mixture. If the feather is burnt it is done well; take it from the fire, and before it is cold add to it one pound of sandarac well pounded, a little at a time, and keep continually stirring it round with a

molle in sangue dagnello o de vitello quando se amaza, e poco stara che sera morbido, et commo sera freddo retornara duro et lustro comme prima.

261. *Questa e un opera oculta filosoficale: cioe fare coralli grossi de li piccoli in questo modo.*—Accipe quella quantita che tu voi de li coralli piccoli finissimi et pistali tanto et polverizali tanto subtilmente che paiano essere senza tatto de poi tolli el sugo de limone che sia bene depurgato in questa forma tolli lo sugo et prima lo distilla per uno panno de lana grosso et questo fa 3 o 4 volte poi lo distilla per filtro tanto che sia bene chiaro poi impasta cum lo dicto sugo la predita polvere in uno vaso de vetrio et commo sonno bene incorporate et imbeverate de vantagio fa che ce sia tanto sugo che avanze sopra alla dicta polvere doi o tre deta de poi tu vederai che produra de sopra una certa graseza o licore grasso piglialo et pollo da parte in uno vaso neto poi tolli le polvere et lassale seccare tanto che fornano dure ad modo duna pasta uno poco durezza de la quale pasta forma li coralli grossi o forma vase o immagine o cavalli o figure o branchi de coralli o quello che te piace et polle in loco dove non sia polvere ne fumj ne vento ne sole et lassale alquanto secare ma prima che siano fornite de secare ungile con quella graseza o licore che riservasti de poi lassale seccare bene in tucto et haverai opera polita et bella e vera et de bono guadagno.

262. *A fare vernice liquida bona.*—Ahvvi lb doi dolio comune et doi libre de semj de lino fresca et fa bullire insiemj in una pignatta vitriata tanto che calla per mita poi la metti in uno altro vaso vitriato commo uno pignato poi havvj uno tre pei et disopra vi mette la dicta pignatta et falli di socto el foco chiaro et commo comenza a bullire e tu ce pone 30 o quaranta spighi de alglio mondato et bene alanato sutili poi ce pone uno poco de alumj de rocho a discretione et lassa bulire et cociare et se voi sapere quando e bene cocta tolli una penna de gallina et bagnala in la dicta cocitura se la penna vien pellata e cocta et facta et levala dal foco e nante che se fredda metrice una libra de vernice da scrivare bene pesta a poco per

stick, and when it is nearly cold add six or eight whites of egg, well beaten and cleared, as they are used for vermilion, and mix the whole well, and then place the varnish for one day in the sun, stir it every hour, and keep it in a cool place, and it will be good.

263. *To make vermilion.*—Take quicksilver, and two parts of yellow or white sulphur, incorporate the sulphur well ground with the quicksilver, and put it into a bottle well luted with lutum sapientiae, and let it dry. Then put it into the oven and give it a gentle fire, and cover the top of the vase with a tile, uncover and cover it frequently, and when you see a yellow smoke come over it is nearly done; let it remain, and give it more fire until a red smoke, almost purple, arises. Then extinguish the fire, and let the bottle cool, and you will have fine vermilion.

264. *To make, with* ¹ *pearls, one fine and very good pearl.*—Take the juice of moderately ripe lemons, and put it into a glazed saucer, and distil [or strain it?] ² and take care not to let dust or smoke or any other dirt have access to it. Then pour the juice into a glazed vessel, such as a cup, and put into the juice as many pearls as you like, let the pearls be perfectly free from all dirt, and let them remain closely covered up until they are well softened. Then take them out of the lemon juice and wash them well with clear water, so that no greenness may remain on the pearls. Then make them up into a paste with water of slugs, which is made in this way. Take the slugs and clean them well, and put them into a glazed saucer, and sprinkle a little salt well pounded upon them, in order to clean them from all slime, and then a little sal-ammoniac, and let them remain so for a day and a night, after which distil them in an alembic, and use the water that comes over for your purpose. Then take a piece of very clean glass in the palm of each hand, and with the pieces of glass make your pearls dexterously round, whether you wish

¹ and ² These words are illegible in the original.

volta e sempre vienj mistando intorno cum uno bastone poi quando sera quasi fredda et tu la cola cum una stamegna poi quando sera fredda mectice sei o 8 albuma dova bene dibatuti et chiara commo se fa per lo cinabrio et mista bene poi la mecti uno di al sole et mistala ad omne ora et serbala al fresco et stara bene.

263. *Affare cinabrio.*—Abbi argento vivo et doi parte de zolpho bianco o giallo et incorporalo lo solpho bene trito cum largento et pollo in una boccia alutata bene de luto de sapientia et lassa sciutare poi la pone nel fornello et falli foco ligiero et copri la boca del vaso cum una tegola et spesso lo scopri et ricopre et quando tu vedi vuscire el fumo giallo sera apresso che facto et lassalo tanto stare et dalli lo foco che faccia lo fumo rosso quasi pavonazo ahlora toli via lo foco et lassa fredare e de facto fino cinabrio.

264. *Affare de perle una bella perla et bona de vantagio.*—Tolli sugo de limone i quali siano mezanamente maturi et mectilo in una scutella vitriata et distillalo per lingua et fa che non vi possa andare polve ne fumj ne altra bructura poi pone lo dicto sugo in uno vaso de vetro commo e una taza poi mecti in lo dicto sugo quanti perlj che tu voj esiendo le dicte perle ben necte da omne loto et salla-vezza et lassale stare ben coverte per spatio che siano ben mollificate dapoi le remove dal sugo e lavale bene cum aqua chiara bene scrillante per modo che non rimanga nisciuna verdeza ale perle poi le impasta cum aqua de lumache la quale se fa in questo modo. Tolli le lumache et mondale bene et mectili in una scutella vitriata poi li pone suso uno poco de sale bene trito acio depurga omne baviglia poi li pone suso uno altro poco de sale armoniaco et lassale stare cusi per uno di et una nocte et poi le pone a stillare per lambicco e de questa aqua usarai ala tua opera poi habbi doi peze de vetro bene polite in cescheduna palma de le mano et cum li dicti peze de vetro le ritonda dextramente o vo fare una o doi o 3 perle o

one, two, or three pearls, or as many more as you like ; and when the pearls are perfectly round string them upon a clean hog's bristle, first boring them with a silver thread or horsehair, and hang these pearls between two saucers of glass, suspended between the two saucers so as not to touch them in any part. Fasten the two saucers closely together, and then put them in the sun to dry ; and when they are hard rub them well with the dust of emeralds and with a cloth. Then take barley-meal, and mix it with the pearls and powder, and rub them well again with the cloth, and they will be bright and fine.

265. *To make sapphire, and to refine and colour it.*—Take a crystal, or a transparent stone, and whichever you take heat it strongly and then quench it several times in cold water ; then pound it, and take an equal quantity of sal alkali, and melt them together. Afterwards put them into a furnace, and add a little zaffiro. And if you wish to have the colour green, add a little minium, and note, that some say that “callamita femina”¹ makes a transparent red. Note also, that these stones are found upon Mount St. Bernard, and are good and perfect crystals, as if they were really mineral.

266. *To make a gold colour.*—Take ley and ochre, of each equal quantities, and grind them with linseed oil ; then mix a little verdigris and black, and grind them together, and then put them in a small jar over the fire, and when the oil begins to boil take it off the fire, and spread it wherever you like, and it will be of a gold colour.

267. *To purify zafirro.*—Take the zafirro and wash it with salt and vinegar, and then keep it in strong vinegar for the space of 6 days, change the vinegar every day, and keep doing this until the impurities are removed and the colour is refined.

268. *To make red glass.*—Take 1 lb. of copper, and melt it,

¹ Agricola (De Metallicis, Lib. v. p. 249) says there were several kinds of minerals called Calamites ; that they differed in appearance and in properties ; that some attract iron powerfully, and these are called the “male calamites ;” others attract it less powerfully, these are called the “female

quanto voli et quando le dicte perle seranno bene retonde mectile in una seta de porcho bene necta et forale prima cum uno filo de argento o cum una seta de cavallo lungha et mecte queste perle in mezo de doi scudelle de vetrio suspese suso in la dicta setula de cavallo per tal modo che le dicte perle stiano in mezo de le dicte doi scudelle in aiere suso in le dicte sete che le dicte perle non tochano in nisciuna parte et le dicte scudelle siano bene serate insiemj poi le pone al sole a seccare et quando seranno duri tu le pone suso de la polve de lo smeriglio et sfregale bene cum quella polvere de lo smeriglio cum uno canavaccio poi tollj semola dorzo et mista cum le dicte perle et polvere et sfrega de novo molto bene cum lo dicto canavaccio et saranno lustre et belle.

265. *Ad faciendum zaffirrum et ipsum affinando et colorando.*—Accipe christallum vel lapidem transparentem et quod vis accipe et eos calefac fortiter demum extingue in aqua frigida pluribus vicibus postea pistetur deinde tolle totidem de sale alcheli et insimul funde et postea pone in furnum et adde secum parum de zaffirro. Et si vis quod fiet viridis adde parum de mineo. Et nota de callamita femina aliquis dicit quod facit rubeum transparentem. Et scias quod dicti lapides inveniuntur in montagna sancti Berardi et sunt perfecti et boni cristallini tamquam de propria minera.

266. *A fare collore doro.*—Tolli ranno et ocria ana et macina cum oleo de semj de lino poi ce mista uno poco de verde-ramo et de nero et macina insiemj poi lo pone in uno pignatino al foco et quando cominza a bolire levalo dal foco et lavoralo dove voi et sera in collore doro.

267. *A porificare el zaffirro.*—Ahavve el zaffiro et lavallo cum lo sale et aceto poi lo tienj a molli nello aceto forte per 6 di et omne di li muta laceto et tanto fa chusci che lo loto o stista vada via ed e facto fino.

268. *Affare vetrio rosso.*—Tolli libra j de ramo et fundilo et

calamites." In the former it is not difficult to recognise the loadstone or magnet; the latter from the properties ascribed to it, such as making copper white when added to it, was probably Electric Calamine, or siliceous oxide of zinc. See Phillips' Min., p. 354.

and when it is melted add 4 oz. of lead, and incorporate them well with each other and throw the mass into cold water, and it will be broken small like grains of corn. Then grind it as fine as you can, and stir it into the glass, and it will become red glass, for making *paternosters* and other articles.

Also note that copper filings thrown into the glass make a red, but they require a very gentle fire. Calcined lead has the same effect, and so also has minium and white lead.

269. *To lay gold upon glass.*—Take very thin bladders of crystal glass, as clean and pure, and liquid as possible, and break them just as you please, and lay real gold upon them. And Frate Giovanni told me that in order to fix the gold on to the glass, it was necessary to employ a solution of borax, the Alexandrian borax,¹ which the goldsmiths use, for this water makes the gold adhere well. And when you have laid the gold on to the white glass, put it in the mouth of the furnace, that is, where you stand to work, so that it may become hot, and take care as it dries to have ready in the furnace the glass upon which you wish to lay the gold, and with this glass some very fine saffron of Mars of the alchemists must be mixed, in order to serve as a mordant for the gold, which will appear of a deeper colour. Then take out of the furnace the quantity of glass which you require, and heat it upon the marble slab upon which you make drinking glasses, and be quick, and take it with the iron for making drinking glasses, and lay upon it the piece covered with gold, and put the gold on the under side of it, that is, let it be between the two glasses. Then put it in the furnace to spread, and spread the glass with the gold in it with another iron, and when you see that it is well spread out and that it adheres well together, take it out and set it to cool on the top, where you set the rest of the glass to cool, and then use it for your own purpose just as you please.

270. *To paint glass, that is to say, cups or any other works in glass with smalti of any colour you please.*—Take the smalti²

¹ This is the true Borax.

² The composition of these smalti is not described. They were probably, as I have mentioned in a former note, like those coloured glasses, or

quando e fuso metice oz. 4 de piombo et lassalo bene incorporare et butalo in laqua fredda et vira minuto commo granelli de grano poi lo trita piu se poi poscia lo mecte nel vetrio et vira vetrio rosso da fare patrenostri et altre lavore.

Idem nota la limatura del ramo messa nel vetrio fa rosso ma vole poco foco et lo simile fa lo piombo arso et simili fa lo minio et la biacha.

269. *A mectere oro in el vetrio.*—Tolli vesiche de vetrio subtilissimi che siano de vetrio christallino polite et necte et cocto quanto piu poi et rompilo commo a te piace et metivj suso loro vero et che frate gioahne me disse per apiccare bene loro al vetrio se voleva torre aqua de borace quella borace Alisandrina che adoperano li orefici et cum quella apicare loro in su lo vetrio la quale aqua lo fa apichare bene et quando hai apicato el dicto oro in su lo vetrio bianco pone lo in su la bocha de la fornace cioe dove stai a lavorare in si facta forma che se scalde poi habbi cura commo e seccho poi debbia el tuo vetrio aparchiato nella fornace in su lo quale voi mectere loro nel quale vetro vole essere miscolato crocum ferri subtilissimo de Archimista et questo vi vole essere dentro acio che facia lo lecto a loro che parera piu collorito poi cava de la forma cio e quella quantita de vetrio che voi et scaldala in su lo marmo dove lavore i bichiere et fa presto poi la piglia cum lo ferro che piglie li bichierj et pone suso la peza dove e loro et pone loro ala parte de socto cioe fa che sia atramendoi queste vetrie poi lo pone nella fornace a stendare cum uno altro ferro et stende quella peza de loro si che sia bene stesa et quando vede che e bene stesa et bene apiccata cavela fora et metila de sopra a fredare dove mectj li altre vetrj poi ladopera al tuo lavoro commo te piace.

270. *A dopengiare li vetrj cum li smalti de omne collore che tu volj commo sonno tazze o altre lavore de vetrio.*—Tolli ismalte

enamels, spoken of in the MS. of the Marciana, No. 325, which were brought from Germany, and which were used for painting on glass.

you wish to use, and let them be soft and fusible, and pound them upon marble or porphyry in the same way that the goldsmiths do. Then wash the powder and apply it upon your glass as you please and let the colour dry thoroughly ; then put the glass upon the rim of the chamber in which glasses are cooled, on the side from which the glasses are taken out cold, and gradually introduce it into the chamber towards the fire which comes out of the furnace, and take care you do not push too fast lest the heat should split it, and when you see that it is thoroughly heated, take it up with the "pontello" and fix it to the "pontello" and put it in the mouth of the furnace, heating it and introducing it gradually. When you see that the smalti shine and that they have flowed well, take the glass out and put it in the chamber to cool, and it is done.

271. *To make blood red glass.*—Take 100 lbs. of white glass and melt it in the furnace, and then take 8 lbs. of calcined manganese pounded, and 8 lbs. of sal alkali, which is to be mixed with the manganese, put these ingredients into a jar in the furnace to remain white hot for one day, and mix them well with an iron rod, and then take the mass out and reduce it to powder. Next take 3 lbs. of this powder and put it with the glass, that is to say, with 10 lbs. of glass ; stir it well with the iron and let it fine itself. If it is too dark, add white glass to it ; and if too light, add more of the material to it, and it will be good and perfect.

272. *To make yellow glass for paternosters or beads.*—Take of lead 1 lb., of tin 2 lbs., melt and calcine them, and make glass for paternosters.

273. *To make giallolino for painting.*—Take 2 lbs. of this calcined lead and tin, that is 2 lbs. of this glass for paternosters, 2½ lbs. of minium, and ½ lb. of sand from the Val d'Arno pounded very fine ; put it into a furnace and let it fine itself, and the colour will be perfect.

che tu volj adoperare et fa che sieno ben tenere et corrente et pistali in su lo marmo o porfido nel modo che fanno li orifice poi lo lava et pollo ne lo tuo vetrio nello modo che lo voi porre poi lo lassa bene seccare poi lo pone in su lorlo de la camera dove se freddano li bichierj dallato dove se cavano i vase frede e a poco a poco lo spigni nela camera verso lo foco che escie da la fornace et habbi cura che non lo metesci troppo presto acio per troppo caldo non scopiasce poi che vedi che e ben caldo tolo con lo pontello et apiccalo al pontello et pollo a la bocha de la fornace a poco a poco li da el caldo metendolo dentro et quando tu vedi che i smalte lucano et che sonno bene stesi et apicati cavali fora et pone a fredare nella camera e de facta.

271. *A fare vetrio incarnato.*—Accipe lb cento de vetrio bianco et mectilo a cociare nella fornace poi tolli lb octo de maganese pisto de quello arso poi tolli lb 8 de sale alchali et mistica cum lo dicto maganese et mecti le dicte cose in uno testo nella caldara ad imbiancare per uno di et mistalo bene cum uno ferro poi cavalo fora et pistalo et fanne polvere poi toi 3 lb de questa matheria et mecti sul vetrio cio e in X. lb de vetrio et mista bene cum lo ferro et lassalo afinare et se fusse troppo scuro metivj dento vetrio bianco et se fusse troppo chiaro agiongivi de la dicta matheria et sera bono et perfectio.

272. *A fare vetrio giallo per patre nostro o ambre.*—Tolli piombo lb j. stagno lb doj. et fundi et calcina et fa vetrio per patrenostro.

273. *A fare zallolino per dipengiare.*—Havve lb doi de questo stagno et piombo calcinato et doi lb de questo vetrio da patrenostroj et doi lb et $\frac{1}{2}$ de minio et meza lb. de rena de valdarno sotilmente pista et mecti in fornace et fa afinare et sera perfectio.

HERE BEGINS A TREATISE ON MOSAIC COLOURS.

AND FIRST HOW TO MAKE THE MATERIAL FOR THE MOSAICS.

274. Take lead and tin, of each 1 lb., melt them together, and calcine them with common salt, until the whole is reduced to powder, in a reverberatory furnace, and then melt the mass and add to it its own weight of raw tartar, and reduce it to powder, and mix it again with common salt and put it in the reverberatory furnace for one natural day. Then wash the salt out with common warm water, and add more salt and calcine it again and continue this until it becomes a white calx. Take 7 lbs. of this calx and 1 oz. of calcined bones, and mix all together and put the mass into a glass pot, melt it and let it remain in fusion for 3 days, and try with an iron rod whether it is well digested and mixed, and it will be mosaic or white glass, of which you may make all other colours in glass as follows. To 8 lbs. of the said material, put one ounce of zaffirri in powder, and mix it well with an iron rod, and when it is quite melted, try with a little of it whether it is a good blue; if not, add a little zaffirro, and let it continue liquid until it is of a good colour. Then cast it, and it will take whatever shape you like, but take care of the wind while you are casting it.

275. *Another kind of mosaic.*—Take 1 lb. of crystal glass, and put it in the fire, and when it is red hot, throw it into spirit of wine in which roche alum is dissolved and so quench it 16 times, and then pulverize it on porphyry and mix with it three times its own quantity of ceruse in powder. Fill a jar half full with it and cover it and lute it down, and put it in a soda furnace and let it remain there as long as if it were soda, and when it is cold you will find your material fit to receive whatever colours you like.

INCIPIUNT COLLORES MUSAICI.

ET PRIMO AD FATIENDUM MATERIAM MUSICAM.

274. Accipe plumbum et stagnum ana lb j et funde insimul et calcina cum sale comuni quousque fuerit totum pulverizatum ad furnum reverberationis post funde cui adjuuge pondus sui tartari crudi et pulveriza et iterum mise de sale comuni et pone in furno reverberationis per diem naturalem postea lava inde sal cum aqua comuni calida post redde aliud sal et iterum calcina ut prius et sic fac tamdiu quod fit calx alba de quo accipe lb 7. ed oz. j. ossum calcinatum et omnia insimul misce et pone in patella vitri et fac fundere et stet ita fusum in fusione per tres dies et cum virga ferrea vide si sit bene degestum et comistum et erit musaicum seu vitrum album intus et extra quo poteris componere omnes alios colores vitreos in tali forma in octo libris supradicte matherie pone oz. j zaffirri pulverizati et misce bene simul cum vergha ferrea et cum fuerit bene fusum proba cum modico si fuerit in colore azurri quod si non esset adde modicum de zaffirro et stet in fusione quousque habeat bonum colorem postea proice et erit in forma quo volueris custodi tamen a vento quando proicis.

275. *Alius modus musaici.*—Tolle christallinum lb j et pone ad ignem et cum fuerit ignitum proice in aquam ardentem in qua sit desolutum polvere aluminis roccj et ita extingue 16 vicibus post pulveriza super porfidum et misce cum eo tantum de cerusa pulverizata et pone in olla ut sit semiplena et coperi et luta et pone ubi dequoquitur soda et ibi stet tantum sicut soda et cum infrigidatum fuerit invenies materiam tuam preparatam ad recipiendum omnes collores quos volueris.

276. *To make a saffron coloured, that is golden coloured, mosaic.*—Take some of the prepared material, and add to it 1 oz. of saffron of Mars, and mix with it 8 lbs. of the prepared white material, and let it stand until it is of a gold colour. If it does not become so, add a little more saffron of Mars, and it will certainly be like gold.

But if you wish to make a red mosaic, put into the white material 1 oz. of alcucu, (?) and 1 oz. of calcined brass to 8 lbs. of the said material, and it will be red. But if you wish to make black mosaic, melt 1 oz. of iron, and 1 oz. of tin, and throw powdered sulphur upon it and it will make a very good black.

277. *To make red mosaic.*¹—Take three parts of the white material, 1 part of calx letitiæ, that is, calx of gold, 1 part of ashes of verzino and three parts of sal gem in powder; mix the whole well together upon porphyry, and set it to melt in a glass pot in a glass furnace and let it remain there for 4 or 6 hours. Then take it out, and you will have a red mosaic.

278. *To make a rose coloured mosaic.*—Take 3 parts of the white material and 3 parts of calx letitiæ, that is calx of gold, and 2 parts of cineris pencholini, *i. e.* brass burnt and reduced to powder, and 3 parts of sal gem, pulverize the whole together, and do as you did before.

279. *To make a pomegranate-coloured mosaic.*—Take 3 parts of the said material, and 1 part of calx solis, *i. e.*, calx of gold, half a part of manganese [?], and 1 part of salgem, and do as before.

280. *To make a blue mosaic.*—Take 3 parts of the said material, 2½ parts of ultramarine azure, and 3 parts of salgem, and it is done.

281. *To make a green mosaic.*—Take 3 parts of the said

¹ This and the succeeding chapter are proofs that the art of producing a red colour from gold was known and practised at this early period. It is not likely that the verzino mentioned in the first recipe could have produced the red colour, for it must have been converted into charcoal long

276. *Ad faciendum mosaicum croceum i. e. colorem aurj.*—Capias de dicta matheria preparata et pone cum ipsa oz. j. croci ferri et misce cum ea 8 libris de dicta materia preparata et alba et stet quousque sit, in colore aurj si non fuerit adde adhuc de dicto crocho ferri et certe fiet ut aurum.

Si autem volueris facere mosaicum rubeum pone in dicta matheria alba oz. j. alcucu, j. es ustum in octo libris dicte materie et fiet rubeum. Si autem volueris facere mosaicum nigrum funde oz. j. ♀ martis et onciam ½ Jovis et proice desuper sulphur pulverizatum et fiet nigrum valde bonum.

277. *Ad faciendum mosaicum rubeum.*—Accipe partes 3 de dicta materia alba et partes j. calcis letitie *i. e.* solis et partem j. cineris brasiliij et partes tres salis gemme pulverizatj et misce omnia simul multum bene super porfidum et pone fusionj in una patella vitrij in furno vitri et stet per 4 vel 6 horas demum extrahe et habebis rubeum mosaicum.

278. *Ad faciendum mosaicum rosatum.*—Tolle partes 3 de dicta matheria et partes 5 calcis letitie *i. e.* solis et partes 2 cinenis pencholimj *i. e.* es ustum et pulverizatum et partes 3 salis gemme et pulveriza omnia simul et fac ut supra fecisti.

279. *Ad faciendum mosaicum granatum.*—Habeas 3 partes dicte materie et partem j. calcis solis *i. e.* auri et partem mediam de maneriaci et partem j. salis gemme et fiet ut supra.

280. *Ad faciendum mosaicum azurrum.*—Tolle partes 3 dicte materie et partes 2 cum dimidia azurri ultramarini et partes 3 salis gemme et fiet.

281. *Ad faciendum mosaicum viridem.*—Capias partes 3.

before the glass melted. I requested the opinion of an eminent chemist on the probable effects of these three recipes, and he told me, that there was nothing in them which could have produced the red colour but the gold.

material, and 2 parts and 2 oz. more of calx of iron, and 3 parts of sal gem, and it is done.

282. *To make a crysolite, i. e., glass of the colour of gold, viz.*
—Take 5 parts of the said material, 10 parts of calcined lead, 10 parts of sal-gem ; put the whole together into the furnace for 5 hours, and it is done.

materie dicte et partes duas cum duabus oz. magis calcis martis et partes 3 salis gemme et fiet.

282. *Ad fatiendum crisolium, i. e., vitrum coloratum colore auri viz.*—Tolle de dicta materia partes 5 saturni arsi partes x. salis gemme partes x et pone omnia insimul in furno per 5. horas et fiet.

HERE BEGINS A TREATISE ON THE VARIOUS
COLOURS WHICH POTTERS USE TO INCREASE
THE BEAUTY OF THEIR VASES.

AND WE MUST SPEAK OF THEM IN ORDER; AND FIRST,

283. *To make fine white with marzachotto.*¹—Take 4 lbs. of calcined tin, 2 lbs. of marzachotto, 2 lbs. of stone,² and 3 oz. of litharge. This is a tried recipe for painting vases.

284. *To make a baked vase white without painting it, if you wish the vase to be white and clean.*—Take 100 lbs. of litharge ground fine with water and with 20 lbs. of powdered tin, and grind the whole together, and then lay it on the jar liquid with water, and it will make it white.

285. *To make a white with glass.*—Take 5 lbs. of tin, 3 lbs. of “*pietra fucara de la viersa*,” 2 lbs. of good glass; and if you wish to improve it, so as to have it still finer, take 1 lb. less of the said stone.

286. *To make a white on which to lay azure.*—Take 8 lbs. of marzachotto, 5 lbs. of stone, and 4 lbs. of tin.

287. *To make white for azure.*—Take 5 lbs. of white glass, 3 lbs. of stone, and 4 lbs. of tin.

288. *To make white for azure.*—Take 2 lbs. of marzachotto, 1 lb. of stone, and 1½ lb. of tin.

289. *To make white.*—Take 6 lbs. of tin, 3 lbs. of stone, and 4 lbs. of marzachotto.

¹ The composition of this substance, which served as a base for the white covering of pottery, is not described. It probably resembled Mastichot or Massicot, which Kunckel (*Art de la Verrerie de Neri*, Merret, et Kunckel, 2^e partie, Livre 2, § première, traduit de l’Allemand par M. D. . . [Baron d’Holback], Paris, 1759, p. 407) says was used for this purpose by the Dutch. It consisted of 100 parts of sand carefully washed and calcined, with 40 parts of soda and 30 parts of potash. For the second preparation

INCIPIUNT DIVERSI COLLORES QUIBUS VASARII
UTUNTUR PRO VASORUM PULCRITUDINE

PER ORDINEM DICENDUM. ET PRIMO,

283. *Affare bianco fino de marzachotto.*—Accipe lb. iiij de stagno cocto *i. e.* stagno calcinato et lb. ij de marzachotto et lb. ij de petra et oz. iij de terra gietta et deprovata per dipenziare vase.

284. *Affare bianco el vaso cocto senza dipentura se tu voi che lo dicto vaso sia bianco et necto.*—Habeas lb cento de terra gietta macinata subtilmente cum aqua et cum lb vinti de Jove spolverizato et macina tucto insiemj poi mecte cum aqua liquido et fara bianco.

285. *Affare bianco de vetrio.*—Tolli lb 5 de stagno et lb 3 de petra fucara de la viersa et lb ij de bono vetrio et se lo voi corregiare che sia piu bello tolli una lb meno de la dicta petra.

286. *Affare bianco per mectare azurro.*—Ahvve lb 8 de marzachotto et lb 5 de petra et lb 4 de stagno.

287. *Affare bianco per azurro.*—Piglia lb 5 de vetrio bianco et 3 lib. de petra et 4 lb. de stagno.

288. *Affare bianco per azurro.*—Tolli lb 2 de marzachotto una lb de petra una lb et mezo de stagno.

289. *Affare bianco.*—Havvi lb 6. de stagno lb 3. de petra lb. 4 de marzachotto.

of this massicot, 100 parts of massicot were mixed with 10 parts of salt, and the mixture was calcined several times. The Venetian MS. in the Sloane Collection, No. 416, mentions "Mazachoto provenzale" as an ingredient in the preparation for working "with azure upon vessels of yerth."

² See No. 285, where it is called "pietra fucara (focaja), (*i. e.*, stone which reddens in the fire, silica flint), de la Viersa."

290. *To make white for a thin and flat coat of azure.*—Put in the mortar 4 lbs. of marzachotto, 2 lbs. of stone, and 3 lbs. of tin.

291. *To make white for painting certain colours devised just as you think proper.*—Take 6 lbs. of marzachotto, 9 lbs. of tin, and 3 lbs. of stone.

292. *To make a white for laying a flat tint of azure.*—Take 6 lbs. of calcined tin, 3 lbs. of stone, and 4 lbs. of marzachotto.

293. *To make white.*—Take 6 lbs. of marzachotto, 8 lbs. of stone, 9 lbs. of tin, and it is done.

294. *To make white for azure.*—Take 12 lbs. of marzachotto, and 12 lbs. of stone, and 13 lbs. of tin, and it is done.

295. *To make white for azure in relief.*—Take 20 lbs. of tin, 10 lbs. of marzachotto, and 12 lbs. of stone.

296. *To make white for azure in relief.*—Take 5 lbs. of fine marzachotto, 6 lbs. of tin with lead, and 4 lbs. of stone.

297. *To refine whites that are hard in the fire.*—Take 10 lbs. of calcined tartar and 1 oz. of manganese.

298. *To make the vase yellow.*—Take litharge only, and it will be yellow, and take care that the earth contains no copper, for it would make it greenish.

299. *To make yellow for glazing on the inside.*—Take 6 lbs. of litharge, 2 lbs. of stone of La Viersa, and 2 lbs. of tufo from Civitella.

300. *To make the vase green.*—Take strips of copper, and grind them fine, and you will make a fine green.

301. *To make a green for glazing.*—Take 12 lbs. of litharge, 6 lbs. of stone, and 4 oz. of copper-parings.

302. *To make a deeper green.*—Take 4 lbs. of tin, 2 lbs. of marzachotto, 2 lbs. of stone, and 4 oz. of copper-parings.

303. *To lay on azure with the paintbrush.*—Take 1 lb. of marzachotto, 1 oz. of zaffirro, 3 oz. of stone, and, if it does not melt, add to it one quarter [of an ounce] of Venetian tin.

304. *For the same purpose, to make azure to lay on with the paintbrush.*—Take 10 lbs. of marzachotto, 2 lbs. of stone, 1 lb. of azure, 1 oz. of smalto; and, if it does not melt, add an ounce more of smalto.

290. *Affare bianco per azurro subtili spianato.*—Recipe nella pila lb 4 de marzachotto lb 2 de petra lb 3 de stagno.

291. *Affare bianco per dipengiare certe collore divisati como te pare.*—Ahvve lb 6 de marzachotto lb 9 de stagno, e lb 3 de petra.

292. *Affare bianco per metare azurro spianato.*—Tolli lb sei de stagno calcinato, lb 3 de petra et lb 4 de marzachotto.

293. *Affare bianco.*—Piglia lb 6 de marzachotto lb 8 de petra et lb nove de stagno fornito.

294. *Affare bianco per azurro.*—Tolli lb xij de marzachotto et lb xij de petra et lb xiiij de stagno facto.

295. *Affare bianco per azurro relevato.*—Ahvve lb xx de stagno lb x de marzachotto et lb xij de petra.

296. *Affare bianco per azurro relevato.*—Havve lb 5 de marzachotto fino lb 6 de stagno cum piombo et lb 4 de petra.

297. *Ad affinare i bianchi duri a foco.*—Recipe lb x de taso cocto et oz. j de manghanese.

298. *Affare giallo el vaso.*—Tolli solo la terra gietta liquida et sera zallo et guarda che la terra non tenga de rame che lo farebbe verdeggiare.

299. *Affare giallo da vitriare dentro.*—Ahvve lb. 6 de terra gietta et doi lb. de petra de la viersa et doi lb. de tufo de quello de civitella.

300. *Affare verde el vaso.*—Piglia loppe de le rame et macinale subtili et farai verde bello.

301. *Affare verde per invetriare.*—Tolli lb. xij de terra gietta et lb. 6 de petra et lb. j. et j. oz. de ramina.

302. *Affare verde de vantaggio.*—Tolli lb. 4 de stagno lb. 2 de marzachotto lb. 2 de petra e oz. 4 de ramina.

303. *A mectere azurro a penello.*—Ahvve lb. j. de marzachotto oz. j de zaffiro oz. 3 de petra et se non fundesse vi mete uno quarto de stagno venitiano.

304. *Ad idem affare azurro per mectare a penello.*—Havve lb. x de marzachotto lb. doi de petra lb. j de azurro oz. j de smalto et se non fundesse mectivi oz. j piu de smalto.

305. *Azure to use with the paintbrush.*—Take 4 oz. of marzachotto, 1 oz. of stone, and 3 quarters [of an ounce] of azure.

306. *Azure to use with the paintbrush.*—Take 12 oz. of marzachotto, 4 lbs. of stone, 1 lb. of azure, and 1 oz. of smalto, and it is finished.

307. *To make azure in relief after the Florentine fashion.*—Take 12 lbs. of marzachotto, 4 lbs. of stone, 1 oz. of enamel, and 1 lb. of azure.

308. *To make azure.*—Put into the mortar for the white 5 lbs. of calcined tin, 4 lbs. of marzachotto, 3 lbs. of stone.

309. *To lay it on with the paintbrush.*—Take 1 lb. of marzachotto, 1 oz. of azure, 2 or 3 oz. of stone, half an ounce of sal gem.

310. *To make azure in relief to lay on with the paintbrush.*—Take 7 lbs. of marzachotto, 18 oz. of stone, 6 oz. of azure, 3 oz. of blue smalto.

311. *To make violet azure.*—Take 14 lbs. of marzachotto, 2 lbs. of stone, 1 lb. of azure, 1 oz. of manganese; and, if it is not sufficiently purple, add half an ounce more of manganese.

312. *To make a good light blue colour.*—Take 18 oz. of terghetta, 12 oz. of stone, 1 oz. of fine azure.

313. *To make a fine coat of azure.*—Take 18 oz. of tin, 6 oz. of azure, and 6 oz. of marzachotto.

314. *To calcine tin and lead.*—Take 100 lbs. of lead and 25 lbs. of tin, and put them into a reverberatory furnace.

315. *An earth for mending broken vases.*—Take 2 lbs. of dry [potter's] earth kneaded, and 3 lbs. of ground stone—a tried recipe.

316. *To make a colour for painting vases, such as Damascus vases or Majolica.*—Take 2 oz. of pietra focara, 1 oz. of lead, 2 oz. of “crocus Martis,” that is, yellow [hydrate] of iron, and it requires a moderate fire, and 3 oz. of marzachotto well purified.

317. *To make azure to use with a paintbrush.*—Take 12 lbs. of marzachotto, 1 lb. of azure, 2 lbs. of stone, and one quarter [of an ounce] of scarlet enamel.

305. *Azzurro per operare a penello.*—Tolli oz. 4 de marzachotto, oz. j. de petra et 3 quarti de azzurro.

306. *Azzurro da penello.*—Capias lb xij de marzachotto lb 4 de petra lb j. d'azzurro et una oz. de smalto fornito.

307. *Affare azzurro relevato a modo Fiorentino.*—Piglia lb xij de marzachotto lb. 4 de petra oz. j de smalto et una lb de azzurro.

308. *Affare azzurro.*—Mecti nella pila per lo bianco lb 5 de stagno scharso lb. 4 de marzachotto lb 3 de petra.

309. *Per mectare a penello.*—Avve lb j de marzachotto oz j. d'azzurro doi o 3 oncia de petra meza oncia de salgemmo.

310. *Affare azzurro relevato per mectare a penello.*—Tolli lb 7. de marzachotto oz. 18 de petra oz. 6 de azzurro oz. 3 de smalto azzurrino.

311. *Affare azzurro violato.*—Avve lb 14 de marzachotto lb 2 de petra lb j de de azzurro oz. j de Manghanese et se non fusse tanto violato metivi meza oncia piu de manghanese.

312. *Affare colore de azzurrino bono.*—Have 18 once de ghetta once xij de petra oncia j d'azzurro fino.

313. *Affare azzurro subtili spianato.*—Tolli once 18 de stagno oz. 6 de azzurro et 6 once de marzachotto.

314. *A cociare i. e. calcinare stagno et piombo.*—Piglia lb C de piombo et lb 25 de stagno et metilo in fornello de reverberatione.

315. *Terra per araconciare vasi rocti.*—Tolli lb 2 de terra secca lavorata et lb 3 de petra macinata provata.

316. *Affare collore per dipingere vase commo vase damasco e de mayollica.*—Ahvve once 2 de petra focara once j. de piombo once 2 de crocho de marte i. e. crocho de ferro et vole foco temperato et once 3. de marzachotto bene purgato.

317. *Affare azzurro da penello.*—Tolli lb xij de marzachotto lb j de azzurro lb doi de petra et uno quarto de smalto vermiglio.

318. *To make a fine yellow for miniatures and other things.*—Put two “Anconitani” of fine silver into a crucible to melt, and heat them in a blast furnace, and, when they are melted, add some well pounded yellow sulphur, and mix all well together. When the sulphur is consumed, add more to it, and continue this until the silver is quite dissolved; then take it out of the crucible, and throw it into an iron trough. When cold, pound it, and grind it upon porphyry; and if it does not grind well, that is, if it is not sufficiently burnt, return it again to the fire in the same manner, and continue this until you can grind it very fine. When the matter has been well ground with clear water, take French ochre, pound it and put it on an iron shovel, and let there be 3 oz. of it, and 6 denarj of common salt calcined; mix, and heat the ochre upon the iron with the salt until it becomes red, and then grind it with the silver upon a brass plate, or upon a smooth brass basin with clear water as fine as possible, and let it dry. When you wish to use it, distemper it with gum water, and use it wherever you like, and you will have a fine yellow for painting and making flowers on black, white, azure, and green, and wherever else you like.

B 319. *To make a water to dissolve pearls.*—Take 2 lbs. of sal-ammoniac, distil it through an alembic, and reduce it to water, and keep it in a well-closed bottle. Put the pearls into this water, and they will be converted into water, &c. This is a water that dissolves pearls, &c.

B 320. *To make pearls just like natural pearls.*—Take pearls and pound them fine, and then put them into the before-mentioned water; then place the vessel containing the water with the pearls dissolved in it on the hot ashes to dry; and when the water is nearly evaporated, and the pearls remain at the bottom of the vase, take it out, and add to it white of egg well beaten as if for vermilion, and knead up the pearls with white of egg like smooth paste. Then take moulds and make the paste into pearls, and let them dry; pierce them, and let them boil in linseed oil. Then take them out and rub them in bran, and

318. *A fare zallo bello per minii o altro.*—Recipe doi anconitani de fino ariento et mettili in uno crugiolo et mettili a fondare et fa fuoco a vento poi commo sonno fusi metice solfaro giallo ben pisto et mista bene insiemj et quando e bruciato el dicto solfaro aragiongivinj piu et cusi fa tanto che el dicto ariento sia bene corrupto poi cava la matheria del crugiolo et gietala in canale de ferro et quando e fredda et tu la pista poi la macina in su lo porfido se non se macinasse bene cioe che non fusse tanto bruciato. Iterum lo ritorna al foco in lo dicto modo et tanto fa cosi che tu la possi macinare subtilissimamente poi che è bene macinato la dicta materia cum laqua chiara tollj ocra francese et pistala et polla in su una palecta de ferro e fa che sia tanta che arivj a tre once et sei denaj o vero denaratj o deratj de sale comuno arso et mista insiemj et scalda la dicta terra in suso lo ferro cum lo sale arso per infino a tanto che torne rossa poi la macina cum lo dicto ariento in una piastra de octone o voi in uno bacili piano de octone cum laqua chiara quanto piu subtili poi lassa siucare et quando la voj adoperare distemperalo cum aqua gomata et adoperala dovj te piace et haveraj bello giallo per dipingere et fiorire in nero bianco azurro et in verde et doi voi altrove.

B 319. *A fare aqua da dissolvere perle.*—Recipe sale armoniaco lb doj et distillalo per lambiccum et reduc in aquam et eam serva in ampullam turatam et pone in dicta aqua perlas et convertuntur in aquam etc. hec est aqua dissolvens margaritas etc.

B 320. *A fare perle naturale quasi.*—Recipe perle et pistali subtilmente poi le pone in la supradicta aqua a dissolverle et pone a zelare la dicta aqua cum le perle solute in le cenere calde et quando laqua e quasi andata via et le perle remangano nel fondo del vaso et tu le cava fora et ponli in albumj dovo ben dibatuta commo per cinabrio et intridi le dicte perle cum la dicta chiara al modo de pasta bene incorporata et habi le forme et fanne perle et lassale scuhare [sciugare?] et falli forare et poi le pone a bollire in olio de seme de lino et poi le toglie et caciale in lo gozo ad uno piaoij per 5 hore et

afterwards in a linen cloth. And if, instead of pearls, you put mother-of-pearl, it is good, and will make good pearls, &c.

Also, the mould for making the pearls must be of fine silver, and gilt, like that for a "Ciara botana,"¹ but small. And many persons have them perforated in order that they may pass a horse-hair through the hole, and that they may be easier to pierce, &c.

B 321. *To make a stucco for making imitation corals.*—Take the white horn of a cow, break it, and soak it in strong ley for the space of a fortnight; then make it boil over the fire until it becomes soft like glue, and so that you can strain it through a cloth or a strainer; and when it is strained, take vermilion in the finest powder, and mix it up with the strained liquid, so as to be like dough, and make paternosters of it in moulds like pearls as before; then boil them in linseed-oil, and let them dry. And if you scrape the horn with a glass, and then soak it in the manner above mentioned, it will soften so that you may strain it more easily, and do with it as before, and you will have fine and beautiful imitation corals.

B. 322. *To make a gold colour for painting earthen vessels previously glazed.*—Take pure silver calcined and burnt with alum, and arsenic and sulphur, three parts of lime, and one part of eggshells; mix the whole together with white of egg and with juice of celandine and distemper it with gum arabic, and with this paint the vases before they are baked.

¹ The word is frequently used by Benvenuto Cellini, who writes it "ciobatana." Florio (Dict., Ital. and Eng., London, 1598) defines it to

renchiude lo pianoj in loco che lo possce havere et poi cavali et stropiciali in lo remolo et poi in lo panno de lino. Et in loco de perle anco se ce pone la matre perle e bona et faraj perle belle etc.

Item le forme da fare dicte perle voglino esser d'argento fino et dorato ad modo de quello de ciarabotana ma piccolini et anco ce sono multi che le fanno forate acio possino poi mectare una seta de porco per mezo el bucio a cio siano piu facili a forare etc.

B 321. *A fare stucho per fare coralli contrafatti.*—Recipe corno bianco de bo et rompilo et mectj lo a mollo in ranno forte per spatio de xv dj poi lo fa bollire al foco tanto che tornj molle ad modo de colla et per modo che se colara cum panno de lino o stamegna et collato che sera tolli cinabrio subtilissimo et bene macinato de vantagio et incorpora cum detta colatura ad modo de pasta et fannj patrestrj cum le forme commo le perle de sopra et poi li fa bollire in olio de semj de lino et lassale seccare. Et se tu radesti el corno sopra dicto cum uno vetro et poi lo mectesti a mollo in lo modo sopradicto et molicarasse in modo che lo colarai piu facilmente et fa commo de sopra et haverai coralli contrafacti et belli etc.

B 322. *A fare collore doro per pegnare vase de terra primo vitriate.*—Recipe argento puro calcinato et abrusciato cum alume de arsenico solphoro parte tre de calcina gusce de ova parte una tucta cum chiara dova mestica cum sugo de celi-donia e distempera cum gomarabico et pigne luase innante che se cocano.

be "a trunk to shoot pellets with one's mouth. Also a kind of mortar-chamber or short bumbard." ;

HERE BEGINS THE TITLE OF THE EIGHTH
CHAPTER.

ON DYES FOR DYEING CLOTH, SILK, SKINS, AND CHAMOIS LEATHER, AND DIVERS OTHER THINGS. ALSO HOW TO MAKE CHAMOIS LEATHER IN MANY AND VARIOUS WAYS. AND FIRST HOW TO DYE CHAMOIS LEATHER.

323. *To dye kidskins with verzino.*—Take kidskins and wash them and press them well with the hand as much as necessary, and then take 9 oz. of verzino well pounded, and add to it 24 bocali full of plain water, and 1 bottle of water of quicklime, which lime must be slaked with a little, that is to say, half a glass, of ley made from the ashes of the vine, and when you see the lime begin to smoke, add to it three bocali of lime water, and pour it into the verzino and let it boil until it is reduced one-third; then strain it and spread the skins one upon another. Then take 4 oz. of roche alum, with 4 bocali of water, and dissolve the alum in the water over the fire, and when the water is tepid, apply it lightly on both sides of the skins with a paintbrush gently, giving them one coat only; then set them to dry in the shade, until they are half dry. Next take the said verzino and make it boil for a quarter of an hour, and then remove it from the fire, and take 1 oz. of fenugreek, and 1 oz. of linseed, well pounded together, and put them into the water with the verzino, let the mixture cool so as to become tepid, then give two or three coats on each of the skins, and each time let them dry until they are soft to the hand, but not quite dry, and stretch them on the pummel. And if you wish to have them of a fuller colour, the more coats of dye you give them the darker they will be. Put them to dry in the wind or in the air in a place where they will not be exposed to the sun, and fold and pull them to

INCIPIT DISTINTIO OPCTAVI CAPITULI

DE TINTIS AD TINGENDUM PANNUM SETAM ET PELLEM IN CAMUSSIUM ET MULTA ALIA. ET DE CAMUSIIS FIENDIS PER MULTOS ET DIVERSOS MODOS. ET PRIMO AD TINGENDUM CAMUSSIUM.

323. *A tenere caprete in verzino.*—Reccipe li caprete et lavalì et premili bene cum le mano tanto che sia bastevile poi tolli once nove de verzino bene pisto et metilo in vintiquattro bocali daqua comuna et j. bocali daqua de calcina viva la quale calcina se vole spengiare cum uno poco de liscia de cenere de vite cioe mezo bichiere de quella liscia et quando lo vede che comenza affumare et tu ce metj tre bocali daqua de calcina et meti nel dicto verzino et lassa bulire tanto che manche el terzo poi lo cola et tolli li caprete et stendilj tuctj uno sopra alaltro poi tolli once quattro de alumj de rocho cum quatro bocali daqua et metti lo alumj a disfare in dicta aqua al foco et commo laqua e divinuto tanto che sia tepida et tu ne da de questa aqua ale pelle cum uno penello da tucti doi li late de le pelle una volta ligiermente poi le pone asciugare alombra tanto che se sciugano per mita poi tolli el dicto verzino et fallo bullire per uno quarto de hora poi lo leva dal foco et tolli once j. de fingreco et once j. de semj de lino pisto bene insiemj et metilo in nel aqua del verzino et lassa refredare che vegna tepida pìoi ne da ale pelle doi o tre volte per pelle et omne volta le lassa sciugare che siano pastose ala mano et non siano secche in tucto poi le mecte ala storta o ala stroppa. Et se piu le voi pine de collore quanto piu li darai la tinta tanto viranno piu cupi et mettili asciugare al vento o alaiere dove non habiano sole et mettile alla stroppa et falle morbide. Et ancho chi volesse piu pino collore tolli uno torlo dovo et

make them soft. And if you wish the skins to be of a still deeper colour, add for the maestra the yolk of an egg to this solution of verzino and stir them together and the colour will be very fine.

324. *To dye kidskins in scarlet.*—Take kidskins soaked with alum, and wash them well until the alum is washed out of them, and for every dozen of skins take 8 oz. of verzino pounded or rasped with a rasp, and put it over the fire with as much water as you may think sufficient for the skins, but the usual quantity is 3 bocali of water for every ounce of verzino, and let it boil until the verzino becomes nearly black. Then remove it from the fire, and let it settle for a night, and in the morning there will appear a certain scum on the top of it, which you must remove gently, because it would soil the skins. Pour one half of this dye into a basin, and put the skins into the other half to soak one by one, and manipulate them well, that is, stir them about and squeeze them and then put them on a string to dry without wind or sun, and when they are nearly dry, put them back into this dye or water one by one, take them out gently, and do not squeeze them. Then put them to dry as before, and when they are nearly dry, work them about well in your hands, and for the maestra take two ounces of tartar, and put it into a glazed jar, and make it boil until reduced one half, or more, and this is the maestra. Then take that first quantity of dye which you set apart, and add to it a little of the maestra and mix them well together, and try it upon your hand; if you see that it has not enough colour add a little more to it, and take care not to add too much, because it would make the dye too dark. And when the dye is tepid, apply it with a sponge on both sides of the skins and put them dripping as they are, upon a string to dry without wind or sun, because that would make them too hard, and when they are nearly dry, stretch them well with the hand or with a wooden hammer until they are quite soft, and this is the best and most masterly practice for dyeing.

mectilo in questa aqua de verzino et stempera insiemj et mectilo per maestra in nella tinta et viranno beletissime.

324. *A tegnare caprecte in vermiglio.*—Tolli pelle de caprette alumate et lavale bene tanto che nescha lo alumj et per omne dosina de pelle tolli 8 once de verzino pisto o raspato cum raspa et pollo al foco cum quella aqua che te pare che sia bastevile per le pelle ma il consueto e questo che per omne oncia de verzino vole tre bocali daqua et lassalo tanto bolire che el verzino diventi quasi negro ahlorà levalo dal fuoco et lascialo posare per una nocte et la matina aparera uno certo panno et quello levalo via legiermente per che faria machiare le pelle poi tollj una catinella et metivj una parte de questa tinta et metila da parte poi tolli l'altra mita et metivi dentro a bagnare le pelle a una a una poi le concia bene cum mano cio e remenale et spremile bene cum le mano poi le cava fora et mectile in una corda asciutare alombria senza vento e sole et quando seranno apresso che sciute et tu le rimecte in questa medesima aqua o intinta a una a una commo prima et cavale legiermente et non le torcere et polle a sciugare al modo disopra et quando sonno a presso che sciute et tu le rimena per mano molto bene et per sua maestra tolli doi once de alumj de feecia et metila in una pignata vitriata et fallo tanto bulire che calli per mita o piu poi tolli de questa aqua per sua maestra et poi tolli quella prima in tenta che reserbasti et mistace uno poco de quella aqua de maestra et miscola bene insiemj et fanni el saggio in su le mano se tu vede che non agia asa collore et tu ve ne gionge un poco piu et guarda non ve ne mectisce troppo perche te daria la tinta troppo cupa et quando la tinta sera tepida vienj bagnando le pelle cum una spogna da tucti doi li cante poi le pone cosi sgociolante in su una corda a sciugare senza vento e senza sole perche le faria incrudire troppo et quando sonno a presso che sciutte et tu le stendi bene cum le mano et cum la stroppa tanto che siano bene

325. *To dye sheepskins scarlet, on the side of the flesh, for shoes.*—Take the skins, and wash and wring them, and work them well with three or four waters, and then beat them well with a wooden hammer in order to press out the water, and then take a dyer's horse and spread the skins upon it and scrape them with a knife so as not to cut them, and squeeze them well, and then stretch them out upon a cord, and let them dry a little, and then beat them with the hammer until quite dry, in order that the dye may not penetrate through the skin. And for every dozen of sheepskins take 9 oz. of verzino well ground, and put it on the fire with two metadelle of water for each ounce of verzino, and boil until the water is reduced one half. Then pour it into a glazed earthen vessel, and cover it up so as to confine the vapour, and put back the lees that remain behind, with ten metadelle of water, and make it boil until reduced to less than one half, and then begin to dye the skins with this last water, of which you must give them two coats, and mix up the lees, and after each time let the skins dry, and the third time give them the stroppe and open them well, and when they are well opened, give them a third coat of the first colour, and then give them a second coat of this colour, and when nearly dry, rub them lightly with your hand; and then, for the fourth time, put for each dozen of skins one metadella, and one-third of ley into the dye, for its maestra. Some persons, in order to make the colour deeper and more brilliant, add two yolks of eggs. When they are dry, dye them with the dye into which you put the maestra, and, when again dry, rub them gently, and they will be done.

326. *To dye sheep-skins scarlet on the side of the hair, to make shoes.*—Take the skins well washed and cleansed from lime, and 4 oz. of galls well pounded, and boil them [in water?] until reduced one-third, and let them become tepid. Put the skins into this water and gall, and wring them well, and then let them remain in the water for a night; then take them out and let

morbide et questa e la migliore pratica et maestra che se faccia per tagnare.

325. *A tagnare montone in vermiglio da lo lato de la carne per fare scarpe.*—Avve le pelle et lavale et storcile et rimenale multo bene a tre o a quattro aque poi torcele multo bene ala stropia acio nesca quella aqua bene poi habbi uno cavalecto et distendile multo bene cum una costa non che taglie et spremile bene poi le stende in una corda et lassale sciugare uno poco poi li da la stropia o la steccha tante volte che sia bene sciucta acio la tenta non passa la pelle. Et per omne dozzina de pelle de montone tolli nove once de virzino bene trito et mettilo al foco cum doi metadelle daqua per oncia de verzino et fallo tanto bolire che advenga per mita poi lo pone in uno vaso de terra vitriato et copriilo bene che non sfiata poi lo cola et rimecte la feccia che rimane al foco cum dece metadelle daqua et fa bullire tanto che mancha piu che la mita poi comenza a tringiare queste pelle cum questa ultima aqua de fecie et dalinj due mano di questa ultima aqua et rimista le fecie et da una volta et l'altra lassale sciutare et la terza volta tu li da la stropia et aprele bene poi che sonno ben aperte et tu li da el primo collore questa terza volta et daglini doi mane et quando sono apresso che sciutte stropiale ligiermente cum mano poi la quarta volta tu vi ni mecte per dozzina una metadella et uno terzarulo de ranno in lo collore per sua maestra et alcuno ce mettj per fare piu lustrenti et piu pino el collore doi torlj dova et quando sono scucte et tu le tengne cum questa tanta che hai dato li dentro la maestra et quando sonno sciute et tu le stropia ligiermente et sonno facte.

326. *A tagnare montonj in vermiglio dal canto del pelo per fare scarpe.*—Abbi le pelle bene lavate et divolte dala calcina poi tollj once quattro de galla bene pista et falla tanto bollire che aventre per terzo poi la lassa devenire tepida et in questa aqua gallata metcj le pelle et storci le bene poi ce le lassa stare per una nocte et poi le tira fora et polle asciutare et quando sonno

them dry, and when they are nearly dry, give them the stroppa, and then take $\frac{1}{2}$ oz. of roche alum to each skin, and make it boil in a vessel with a small quantity of water, and soak the skins in this alum water, and squeeze and wring them so that all the water may run well out. Then take a piece of lime which has not been slaked, put it into a basin, and add to it enough water to cover it by one finger's breadth, and stir it well, so that it may be perfectly dissolved; then let it settle, and when it has settled for one night take off the scum or crust which the lime forms on the top of the water, and then take two bocali of fresh water, and pour them into a pan, and when the water boils put into it 2 oz. of verzino well pounded, and boil it until it is reduced one-half, add to it a little pounded gum arabic, and remove it from the fire, and when it is tepid take away the skins, and sew them up all round so that the side of the flesh may be outside, and leave the neck open, and pour in the dye through the neck, and stir and shake it well 4 or 5 times in the dye, so that the dye may cover the whole of the skin. And if you wish to have a fuller colour, add to it for its maestra as in the last recipe a yolk of egg, well beaten up, adding it a little at a time to the dye until the colour appears full enough. Then pour it into the skin, and shake it all over it, so as to touch every part. When the skins are dry, polish them on a smooth bench with glass, and they are done.

327. *To dye dog-collars and couples a good and fine scarlet.*—Take the skins, wash them well with fresh water, and let them dry; then take 3 oz. of roche alum to each skin, boil the alum [in water], and when it is dissolved and tepid give each skin two or three coats of it. Then take for each skin 3 or 4 lbs. of galls well pounded, boil them a little, and let them cool so that you can bear your hand in the liquor, and then put this water and galls into a bucket, and shake the skin well about in this water, and let it remain in it a day and a night that it may become soft. Then put it to dry, and while it is drying, work it about in your hands that it may become soft. When it is well dried, take 3 oz. of verzino well pounded for each skin, and to

apresso che sciute et tu le stroppa et stecchale poi tollj una oncia dalumj de rocho per pelle et fallo bulire in uno padelecto cum una bocalecta daqua poi mectj le pelle a mollo in questa aqua alumata et spremile et storcile bene sicche nesca via quella aqua multo bene. Et poi tollj de la calcina in petra che non sia disciolta et metila in una catinella et metive tanta aqua che sopra avance uno deto et mista bene che se disolva tucta de vantagio poi lassala riposare et commo e bene riposata per una nocte et tu li leva via uno certo solo o panno che la calcina perdura disopra alaqua poi tollj doi bocalj daqua frescha et mectila in uno padelecto et quando bollj et tu ve pone dentro doi onci de verzino ben pisto et fallo bollire tanto che manche la mita de et mectivj uno poco de gommarabico pisto et levalo dal foco et commo e tepido et tu tollj le pelle et coscile de intorno intorno per modo che lo lato de la carne vegna di fora et lassa el collo scoscito et per quello collo scuscito vi mettj la intenta et manegiala et rimenala multo bene de vantagio in qua et in la cum la intenta 4 o 6 volte tanto che la intenta agiungha per tutto la pelle. Et se tu volesci lo collore piu pino metivj per sua maestra la derieta volta uno torlo dovo bene sbatuto et metilo in la dicta intinta a poco a poco tanto che te paia che sia pino poi lo mecte in la pelle et dallj bene de intorno dela et di qua remenando la dicta pelle poi che sonno tente et tu le liscia in uno banco polito cum lo vetrio et sonno facte.

327. *A tenere pelle de sovatto in vermiglio bone et belle.*—

Havvj le schinj et lavale bene cum laqua chiara et lassale succare poi tollj once tre de alumj de rocho per cescuna schina et fallo bollire et quando e tepido che sia bene disfacta dannj doi o tre mane per schina poi tolle per omne schina lb j. de galla bene pista et mectila a bollire uno poco et lassala refredare tanto che tu ce posse patere la mano poi mectj questa aqua gallata in una bigoncia et menerai la schina multo bene per quella aqua et lassala stare cuscì undi et una nocte che se molla bene poi la pone a sciucare et infinentre che se sciucca et tu le palmegia acio diventano morbide et quando e bene sciuta tolli once tre de verzino per cescuna schina bene pisto et per omne oncia de

each ounce of verzino put two bocali of water, and then add two glasses of solution of tartar, and put it into the verzino when it is boiled, and then add $\frac{1}{2}$ oz. of gum arabic, and put this dye into a glass vessel, as clean as possible. Then take the grounds of the verzino, and add to it 3 glasses of water, and make it boil until reduced one-half, and with this water, boiled on the grounds, begin to dye the skin with a paintbrush or a sponge, and let the dye be tepid, and so put it on as often as necessary, but do not put too much tartar (which is its maestra), that it may not be too highly coloured; and when you dye it, let it dry each time, and when it is dry rub it with your hands, and then with the stick on the side of the flesh to make it soft, and it is done.

328. *To dye scarlet.*—Take $\frac{1}{2}$ lb. of sandal wood and $\frac{1}{2}$ lb. of madder, boil them together with plain water until reduced to one-half, and then add half a foglietto¹ of ley for its maestra to make the colour deeper, and a piece of quicklime, and boil it until reduced to one-third; then prepare the skins for dyeing as in the other recipes.

329. *To dye very fine scarlet.*—Take 1 lb. of verzino columbino well ground, and soak it in clear water for the space of two days, and then put it into a boiler containing 3 or 4 bocali, to boil until reduced by one-third, add to it 2 oz. of quicklime and 3 oz. of roche alum; and if the colour is pale add 2 oz. of fenugreek; and if you wish to have it of a fuller colour add a foglietto of boiled ley and it will be of a fine colour.

330. *To dye skins of a very beautiful and good purple colour.*—First take the skin prepared like chamois leather, and dip it two or three times in clear water, and shake it and wring it, and then take 2 oz. of roche alum, and put it into two bocali of plain water, and make it boil, and let it cool. Then take the skin, and dip it in the alum water, and wash and wring it well, and let it dry in the shade. Then take 2 oz. of

¹ A liquid measure used at Florence.

verzino metivj doi bocali daqua et poi ce mectj doi bichiere de aqua de alumj de fecia et polla in lo verzino quando e cocto poi ce mectj meza oncia de gommarabico poi mecti questa tinta in uno vaso de vetro neto quanto poi poi tolli quello fondaccio de verzino et mectice dentro 3 bichiere daqua et fallo bollire tanto che manche la mitade et cum questa aqua del fondaccio comenza a tegnare in su la schina cum uno penello o vero una spogna et fa che la tenta sia tepida et cusi vi ni da tante volte che sia asai et non cemectare troppo alumj de fecia che e sua maestra acio non havesse troppo collore et quando tu li daraj la tinta lassa sciugare per omne volta et quando e facto et tu la mena cum mano et poi cum la stecca dal canto de la carne che divente borbida (*sic*) e de facto.

328. *A tegnare in vermiglio.*—Tolli meza libra de sandoli et meza lb de robbia et fa bullire insiemj cum aqua comuna per in fino divengha piu che la mita poi ce mectj meza foglieta de ranno da capo per sua maestra et piu pino lo colore mectice una zupa de calcina viva et fa bullire tanto che arentre per tertio poi nutrica le pelle per tegnare commo in le altre recepte.

329. *A tegnare in verzino bellitissimo.*—Abbi libre j de verzino columbino bene trito et metilo a molle in aqua chiara per spatio di doi di poi lo mecte in uno caldaro de 3 o 4 bocali a bullire tanto che calli per terzo poi ce mecti doi once de calcina viva et 3 once de alumj de rocho et se el collore fusse chiaro mectice doi de fino greco et se lo volesti piu pino mectice una fogliecto de ranno bollo et sera bono collore.

330. *A tegnare le pelle in colore de pavonazzo bellitissimi et bone.*—Prima tolli la pelle concia in camoscio et bagnala doi o 3 volte in laqua chiara et remenala et storciala poi tollj doi once de alumj de rocho et mectilo in doj bocali daqua comuna et fallj levare el bolore poi la lassa fredare poi tollj la dicta pelle et bagnala in la dicta aqua alumata et lavalala et storcila bene poi la pone asciucare alombra poi tollj doi once de verzino bene

verzino, well pounded, and put it into a boiler with three bocali of water, and make it boil until it is reduced by one-third, and take the skin, very dry, and stretch it well, and then take the verzino, which must be tepid, and spread it over the skin with a paintbrush, or with a sponge, and let it dry in the shade, and out of the wind. When it is dry give it two other coats of the verzino, letting it dry between each coat. Then take a lump of quicklime, and put it into a piece of linen, and tie it closely and dip it into what remains of the verzino, and while you are thus wetting it, press out all that you can into the verzino, and then take the skin, and give it another coat, and it will become purple and beautiful. And if you wish to dye more than one skin, take for each skin 2 oz. of alum and 2 oz. of verzino, and as much water as was mentioned above, and make it boil as before.

331. *To dye skins red.*—Take the root of knot grass, otherwise called blood wort,¹ which children put to their nose or tongue to make it bleed; then take one metadella of strong white wine vinegar, and put into it some of this root very well pounded, and make it boil until reduced one half, and then put this dye into a pan, and when it is tepid dye the skins, and give them so many coats that they may have a good colour. And you may reduce this root to powder, because it is then good for dyeing all the year round. When the skins are dry rub them in your hands to make them soft.

332. *To dye kidskins green.*—Take of the grains or berries of the plant or shrub called privet, by some called also “fioria,” and by others “oriola,” which has a leaf like the laurel, and its leaf grows crosswise upon the bough, and at the end of the bough there grow several berries, black like pepper, which resemble ivy berries, and which are ripe in the month of September. Take 1 oz. of these berries for each skin, and then take several tender twigs of a fig tree, and cut them into little bits, and then distemper the said privet berries with two cups

¹ Polygonum Aviculare.

pisto et metilo in uno caldaro cum 3 bocali daqua et fallo tanto bollire che arentre per terzo poi tollj la dita pelle bene sciuta et stendila bene poi tollj el verzino che sia tepido et dallo sopra ala dicta pelle cum uno penello o spogna et metila a sciugare alombra et senza vento poi che e sciuta dallj doi altre mane de lo dicto verzino et sempre da una mano alaltra lassa sciutare. E de poi tollj una zuppa de calcina viva et metila in una peza de panno de lino et lega la bene poi tollj la dicta peza et bagnala in quello verzino che te rimase et commo tu la bagni cusi la vieni spremendo in lo dicto verzino quello che cenuscira poi tolli la pelle et darai li una altra mano et lassa sciugare et sera pavonaza et bella. E se tu volesci tegnare piu che una pelle tolli per omne pelle doi once de alumj et doi once de verzino et tanta aqua quanta fu dicto sopra et fallo tanto bulire.

331. *A tegnare in rosscio la pelle.*—Ahvvi radice de herba spagnola alias dicta Saguinarella che li fanziulli se la mectano al naso o vero alla lingua per fare uscire el sangue poi tollj una mectadella de aceto forte de vino bianco et metivj dentro de questa radice pista bene et fa tanto bullire che manche la mita poi mecti questa tinta in una catinella et quando e tepida vienj tingendo le pelle et dalinj tante mane che habia bona tinta et de questa radice fanne polvere perche e bona tucto lanno per tegnare poi che le pelle sonno sciute menale per le mano acio diventano morbide.

332. *A tengnare caprecte in verde.*—Tolli de quelli granj o acinj che fa questa herba o arbore che se chiama olivella et alcuno la domanda fioria et chi la chiama oriola che fa la folgla commo lorbacho et fa la folgla in cruce in su la rama et in capo ce fa parecchj granj commo pepere nigri et sonno commo acinj o pipere de hellola et sonno mature del mese de setembre colglie de li dicti granelli once j per pelle poi tollj parecchi ramictinj de fico tenere et talglialj in frustri menuti poi distempera cum doi scudelle daqua la dicta olivella et bene sbactuti

of water, and beat it all up well together and let the water boil for a quarter of an hour, and then set it to cool until it becomes tepid, and before you boil it, put into it a glassful of strong vinegar; and when it has become tepid, lay two or three coats of this dye upon the skin, until it is well dyed. And if you wish to have the dye of a deeper colour, add more of the privet berries, and it will be a fine bright green.

333. *To dye skins green.*—Take ripe buckthorn berries and put them into a boiler, and add an equal quantity of vinegar, that is, an equal weight to that of the berries, and let it boil a little, and then strain it through a piece of linen cloth, and pour it into a glazed vase, and when you wish to use it, take the skins, and spread the colour upon them with the paintbrush, and they will become green, and you can keep this colour or dye for a whole year, if kept well closed.

334. *To dye the skins green.*—Take some “*pero citrino*” when ripe, and extract the juice, and then add some good and strong white wine to that juice, that is to say, for every *petitto* of juice, two of wine, and boil them together until reduced one half; then take a hare’s foot or a paintbrush, or a small sponge, and dip it in the juice and dye the skins once or twice with it, until you consider the colour to be sufficiently deep. It must be dried without sun or wind.

335. *To make a green dye for dyeing cloth, thread, or silk.*—Take roche alum, and dissolve it in a boiler, and let it boil till it is well dissolved; then take it off the fire, and let it cool so that you can bear your hand in it, and then put the cloth, or silk, or thread, into it, and let it remain for a day and a night, and then take it out and let it dry well. Next take a little verdigris and make it boil in the water, and then remove it, and when the water is become tepid, put the cloth into it, and work it well in your hand, and let it dry, and if you give it another wetting with a little roche alum, it will become of a brighter colour. If you wish it to be darker, add more verdigris.

336. *To dye skins blue.*—Take for each skin 1 oz. of indigo,

insiemj et poi pone a bullire dicta aqua per uno quarto dhora poi la pone a fredare tanto che diventj tepida et nante che tu faci bulire metice dentro uno bichiero daceto forte et commo sera divenuta tepida et tu da de questa intinta a le pelle doi o 3 mane tanto che sia ben tento. Et se le voj piu cupi mectivj piu de quelli granellj et vira verde chiaro et bello.

333. *A tegnare pelle in verde.*—Accipe semina spinj cervinj matura et micta in caldario et tamtumdem fortis aceti scil. quantum est pondus semina predictorum et fac ut buliat parum demum cola cum peza alba linj pannj et eum pone in vitriato vase et cum vis operare acipe pellas et da super eas collorem illum cum penello et veniet virides et potes servare dictum collorem sive intintam per totum annum bene clausa.

334. *A tegnare la pelle in verde.*—Tolli del pero citrino quando sonno mature et trannj el sugo poi tollj vino bianco bono et grande et mectilo in quello sugo cioe per omne pectito de sugo doi de vino et fa bullire insiemj tanto che callj per mita de poi tolli uno pe de lepore o uno penello o uno poco de spogna et bagna in quello sugo et tegne le pelle una volta o doi secondo che te pare che habia vivo collore per omne volta vole essere sciuta senza sole e senza vento.

335. *Affare tenta verde da tegnare panno, o refe o seta.*—Recipe alumi de rocho et metilo a strugiare in una caldara et fallo bullire tanto che se distrugia bene poi lo leva dal foco et lassalo refredare tanto che tu vi possci patere la mano poi ce mecti dentro lo panno o sete o refe et lassalo per uno di et una nocte poi lo tira fora et lassalo bene sciucare poi tolli uno poco de verderamo et fallo bullire in la dicta aqua et poi la leva via et quando laqua sera diventata tepida et tu vi mecti lo panno et manegialo bene cum mano et pollo a sciutare et se tu li darai uno altro bagno cum uno poco dalumj de rocho vira cum piu vivo collore et se piu cupo lo volesci mectivi piu verderamo.

336. *A tegnare pelle azurre.*—Summe pro qualibet pelle

and grind it well with strong vinegar, and to each ounce of indigo take one foglietta of vinegar, and dip a paintbrush or a hare's foot into it, and lay it upon the skins, and dry them in the shade. Then give them a second coat, and let them dry, and they will be very beautiful. And if you boil the vinegar a little with the indigo, the skin will be of a much brighter and fuller colour.

337. *To dye the skins black.*—Take the skin prepared with sumach and scrape it on the side of the flesh and rub it well with pumice stone; then take whites of egg, and lay them on the side which you have pumiced, and let it dry. Next take fine black, and lay it with a paintbrush upon the white of egg which you laid upon the skin, and let it dry, and then take the maestra mixed up with oil, and lay it upon the black with a paintbrush, and let it dry in the shade, and then break it with the stecca, and it will be like silk, and its maestra is lime water mixed with common oil.

338. *To make a black dye for dyeing skins, that is to say, fine shoemaker's black, without iron.*—Take a boiler full of the juice of sumach, and add to it some dust from a wheel [or grindstone] and let it boil until reduced by two fingers' breadths in depth; and when it is cool you may dye the skin with this dye, and every hour it will be a finer dye.

339. *To dye kidskins a fine and beautiful black.*—Take the skins, and wash them very well in three or four waters; then squeeze them and wring them well in the stroppa until the water is run well out of them. Then stretch them upon a string to dry, and for every dozen of kidskins take 2 oz. of verzino ground, and boil it until it is reduced to one half, and then take it off the fire, and when it is tepid begin to lay the colour on, and squeeze it well with your hands, and each time let the skin dry a little, and do this 3 or 4 times, and the 4th time put a little very clear lime water into the dye with which you dyed the skins, and this is its maestra, and dye them the fourth time, and when they are nearly dry, give them the stroppa until they are dry. Then take a little oil with a sponge, and

uncia j de indico et eum bene macina cum forti aceto et pro qualibet oncia indici unam foglietam acetj et infunde penellum aut leporis pedem et da super pellas demum sicca eas sine sole deinde desuper alteram vicem dictam tintam et permite sicari et erunt pulcherrime. Et si facies bulire aliquantulum dictum acetum cum dicto indico venient tibi multum magis clare et colloris plene.

337. *A tegnare le pelle in nero.*—Tolli la pelle concia in scotano et radda ben dal canto de la carne poi tolli una pumice et pumiciala bene poi tolli chiare dova et dalli dal canto che tu hai pumiciato et lassa sciugare poi habbi lo nero fino et dallo cum lo penello sopra a la dicta chiara dova che desti sopra ala pelle et polla a sciugare poi habbi la maestra incorporata cum lolio et dalla sopra a lo nero cum lo penello et polla a sciugare alombria poi la rompe ala torta poi la rompe ala stecca et sera morbida commo seta et la sua maestra sci e aqua de calcina viva mista cum oleo comune.

338. *A fare tenta nera per tegnare pelle cioe tenta da calzolare fina senza ferro.*—Ahvve uno caldaro daqua de scotano frugato e falla tanto bullire che calli quatro deta poi ce metcj de lo lozo de rota et bolla tanto che calli doi deta et quando sera fredda cum questa aqua tu porai tegnare la pelle et omne hora sera piu fina tenta.

339. *A tegnare caprecti in nero fini e belli.*—Tolli le pelle et lavale molto bene a 3 o a 4 aque poi torcele et spremile bene alla stecca o ala stroppa tanto che nesca bene quella aqua poi le stende insuso una corda asciugare et per una dozzina de pelle de capretti tollj once doi de verzino trito et fallo bollire tanto che manche per mita poi lo leva dal foco et quando sera tepido et tu li comencia a dare el collore et premili bene cum le mano et da luna volta et laltra lassale uno poco sciugare et cosci fa 3 o 4 volte poi la quarta volta pone in nella tinta che hai tinti li caprette uno poco daqua de calcina viva che sia ben chiara et questa e la sua maestra et tinge la quarta volta et polli a sciugare et quando sonno a presso che scitutte et tu li da la stropa tanto che siano sciucte poi tolli uno poco dolio cum

lay on the kidskins as much of it as they will take, and then give them the stroppa in order that the oil may penetrate well into the skins. When you have done this, roll up each skin into a lump by itself, and let it stand so for a night, and then give them the stroppa again, and spread them out in the shade, and they are done. And know, that the more you soften them with your hand or with the hammer, the softer they will be.

340. *To dye sheep or kidskins a fine and good black.*—Take the kidskin or sheepskin, and wash it and wring it till the water comes off it clear; then take galls well pounded, which you have proved to be strong by trying them in your mouth, and put them into a pipkin, let them boil, and then let them cool so as to become tepid. Then take the skin and gall it well; afterwards wash it with fresh water, and squeeze the water well out. Then take shoemaker's dye, that is, atramentum; steep the skin in it and let it soak for the space of 4 hours; then wash it well, until the water comes off clear and clean. Then take ley and a little oil, and wet the skin with this mixture, and it will become as soft as silk.

341. *A way of preparing skins with the hair on, or without the hair, that is to say, deerskin or wolfskin, or badgerskin, or other skin, or kidskin, or goatskin, or the skin of other animals. And it is a well tried preparation.*—Take skins which have been taken off the animal in proper time, and not from unhealthy beasts, and let them be dried without sun, or let them be a little salted, and put them into a tub of water, and let them remain there for the space of 5 natural days, in order that the flesh may be well macerated, and in the course of these 5 days renew the water 2 or 3 times on account of the unpleasant smell which arises from them. Then take them out, and let them drain, and when they are drained, put one upon the other on the bench for cleaning the skins from flesh, those that are fleshy, I mean, and then strip the flesh from the skins just as you think proper, and so lay one upon another in order that you may not cut them with your knife, and when you have

una spogna et dallo a li caprette quanto ne ponno portare poi li da la stroppa acio lolio penetra bene le pelle facto questo et tu reingoluppa omne pelle da per se commo uno pane et lassa stare cusi per una nocte poi la da la stroppa de novo et distendile alombra et sonno facte et sappi che quanto piu le remorbidiraj cum le mano tanto piu seranno morbidi et cusi cum la stroppa.

340. *A tegnare montone o capretto in nero belli et bonj.*—Piglia la pelle de capretto o de montone et lavalala et storcila tanto che nesca laqua chiara poi tolli galla ben pista che tu senti ala bocha che sia forte et metila in uno pignato et lassa bullire poi lassa fredare che divente tepida poi tollj la pelle et gallala bene che ella sia ben gallata poi lavalala bene cum laqua fresca et torcila bene che nesca quella aqua poi tolli tenta da calzolare cioe lagrimento et metti la pelle in la sopradita tenta et lassala mollare per spatio de 4 hore poi la lava multo bene tanto che nesca laqua necta et chiara poi tollj liscia et uno poco dolio et bagna la sopradita pelle et vira morbida ad modo duna seta.

341. *Modo da conciare pelle cum lo pelo et senza pelo cioe pelle de cervo o de lupo o de tasso o de lotrie o de capretti o de capre o daltri animali e de concia probata.*—Recipe pelle scorticate a stagione e non sieno de bestie che habiano insanita et sieno secche senza sole o vero alquanto insalate et metile in una tina daqua et lassale stare li dentro per spatio di 5 di naturali acio lo carnacio sia ben macero et infra questi 5 di renova laqua doi o 3 volte ale dicte pelle pelle per la puza che fanno poi le cava fora et lassale scolare et scolate che sonno pune luna sopra alaltra in el banco da scarnare pele cum carne in tende bene poi excarna le dicte pelle commo te pare et pone cusci luna sopra a laltra acio non te vengano guaste cum lo cortello et scarnate che sonno levale dal banco et lassale scolare bene poi tollj uno barile daqua et falla bulire et in questa aqua pone libre 4 de sale et commo el sale e disfacto bene et tu la lassa refredare tanto che divente tepida et in

stripped the flesh off, remove them from the bench and let them drain well ; then take a barrel of water, and make it boil, and put into it 4 lbs. of salt, and when the salt is quite dissolved, let it cool until it becomes tepid, and into this tepid water put half a wheaten loaf, and move it about with your hands until it is well dissolved. Then add to it some flour made from corn (barley flour is best), and put as much as you think sufficient, so that the water may be tolerably thick, and know that the flour must not be bolted or sifted, but must be mixed with the bran just as it comes from the mill. Having done this, and having mixed the tepid water with the meal, put in the skins one by one, stirring them well with your hands without stretching them, and let the flesh be underneath, stretching out one skin nicely over another. Let them remain in this way for the space of 2 days, then take them out and let them drain well for the space of half a day, and in the evening put them back into the water, and let them remain in it 3 days, and stir them well, and at the end of three other days repeat the process, and put the skins back again into the water, and let them remain for the space of 6 days in all, besides the other two days before mentioned ; and this is done in order that the hair may adhere more firmly. Then take them out of the preparation and put them to dry in the shade for the space of one night ; then arrange them in order, one upon another, upon planks or boards to remove the flesh from them, which you must remove just as you think proper. And when you have done so, scrape them well, and take roche alum in crystals, and not in powder, for it is better, and put for 12 wolfskins, or deerskins, or similar skins 12 lbs. of roche alum, so that each skin may have a pound of alum, and 24 petitti of water, which will make two petitti for each skin, and let the alum dissolve well in the water over the fire, and do not let the alum and water boil. Then put into the water 4 lbs. of salt, and when it is perfectly dissolved, let the water cool until it is tepid ; then soak the skins in it, allowing for each hide one petitto of the solution of alum and salt, stirring the skin well with your hands

questa aqua tepida metice mezo pane de formento et menalo bene per le mano tanto che sia ben disfacto poi mette in la dicta aqua farina de grano ma e meglio dorzo cioe quella farina che te pare bastevile et che laqua dala farina sia uno poco spessa la prima volta sappi che la farina non vole essere staciata ne stamignata ma vole essere con la remola commo ella viene dal molino facto questo essendo laqua tepida cum la dicta farina metcj dentro le dictj pelle ad una ad una et menandole bene cum mano senza extirarle et fa che lo carnaccio sia desocto bene steso luna pelle sopra alaltra et lassale stare in questo modo dentro per spatio de doi dj da poi le tira fora et lassa le bene scolare per spatio de mezo giorno et la sera le remecte in nela dicta aqua et lassacele stare dentro 3 dj et mistale bene et in capo de tre altre di fate purre a questo modo et remetile purre de dentro et lassale stare per spatio de sei di in tucto et questi altre doi di desopra et questo se fa perche el pelo se ferma meglio de poi le tra fora de la dicta concia et polle asciugare alombra per spatio duna nocte poi le pone ordinatamente luna sopra alaltra in table o assci da scarnare et poi scarna commo te pare et scarnate che sonno scrullatile bene poi tolli alumj de rocho che sia in peze et non in polvere che e meglio et metci per xij pelle de lupo o de cervo o similj a queste xij libre dalume de rocho che omne pelle ne venga ad havere una libra e 24 petitti daqua che vengano doi petitti per pelle et lassa ben disfare lo alumj al foco in questa aqua et fa che laqua non bolle cum lo alumj poi ce mette dentro quatro libre de sale et commo e bene disfacto lassa tanto refredare laqua che advenga tepida poi mette in confetione le dicte pelle et per omne pelle li da uno petitto de la dicta aqua cum lo dicto alumj et sale et menandole bene per mano in nella dicta aqua tepida per spatio de uno miserere extirandole et manegiandole ad una ad una bene sucte sopra ne la dicta aqua poi la goluppa et pon le cum la dicta confetione et ponile da parte et cosi fa actuctj lavanzo de le pelle et lavanzo de laqua che te remane o vero confetione gietala sopra ale dicte pelle et fa che le pelle sieno atese in la tina luna sopra alaltra et

in the tepid water for the space of one miserere, stretching and turning them about well one by one in the water. Then roll the skin up, and put it in the composition, and lay it aside; do the same to all the rest of the skins, and pour the remainder of the water or composition upon the skins, and let the skins be stretched out in the tub one upon another and so let them remain for the space of a day and a night, and know that if the skins are small, such as kidskins, two skins require but 1 lb. of alum. Then take them out, and let them drain for the space of half a day, and collect what runs off them, together with the other water that was left from the skins, and set it aside. And then, in order perfectly to clean the skins, take corn flour, (but barley flour is the best,) that has been bolted, that is to say, as much flour as you may think sufficient, and wet it with the alum water which you reserved, and let the flour be mixed up well with the water like paste for making fritters. Then put into this paste 16 eggs, as well the shell as the white and yolk, with a glass of oil, rather less than more, and mix them up well together. Let the water be rather warm before you add these ingredients, and mix the whole well together. Then take the skins one by one, and fold them in the middle, that is, so that the hair may come on the inner side, and not be soiled by the preparation. Then put the skins one by one into the preparation or mixture, which must be tolerably liquid, and let them be thoroughly wetted by the mixture; then pile them one upon another, and if you have any of the mixture remaining, throw it upon the skins. Let them remain for a day and a night, and then take them out, and put them to dry in the sun, or, which is still better, in the shade, and take good care not to stretch them in the least until they are dry; and when they are dry rub them down well upon a sharp piece of wood made expressly for this purpose, in order that the flour may fall off. Then cut off the flesh with a very sharp knife, and scrape them with an osier wand, and afterwards rub them well with the hand, that they may become soft. And know that this preparation is better in April and May, and also in September and October.

lassale stare dentro per spatio duno di et duna nocte et sappi che se sonno pelle picollinj commo e pelle de capretto le doi pelle vogliano una libra de alumj et de poi tirale fora et lassale scolare per spatio de $\frac{1}{2}$ di poi recoglie la dicta scolatura cum questa altra aqua che ce advanzata dele pelle et ripolla da parte. Et poi per affinare perfectamente le dicte pelle tollj farina de grano ma e meglio de orzo che sia aforata cioe quella farina che te pare che sia bastevile et stemperala cum laqua de lo alumj che reservasti da parte et sia bene misticata la dicta farina cum la dicta aqua ad modo duna pasta da fritelle et poi in questa pasta ce mette 16 ova cum le coze et cum tucti chiare et vintellj et rompili bene insiemj et metice uno bichiere dolio o manco che piu et mistica bene insiemj poi fa che la dicta aqua sia uno poco calda prima che tu ce mette le dicte cose et mistica omne cosa bene insiemj poi tolli le dicte pelle aduna aduna et indopiale per mezo cioe che lo pelo venga per de dentro et el carnazo sia de fora et acio che el pelo non se habia troppo ad imbrutarse per la dicta concia et metile in la dicta concia o vero pinta et sia competentemente liquida et metti dentro le pelle ad una ad una et fa che sieno bene impastate da la dicta pinta et pone luna sopra alaltra et se te avanza de la dicta pinta gietala sopra ale dicte pelle et lassale stare per spatio de uno di et una nocte poi tirale fore et polle asciugare al sole o a lombra che e meglio et guarda bene che non le stirasce per veruno modo per infino che non sonno sciuche et quando seranno sciuche sfregale bene sopra ad una stecha de merollo bene tagliente facto a quello mistiero acio che la farina se ne cagia tucta poi le scarna cum lo cortello bene tagliente et scruttale bene cum una vengastra poi le remena bene cum mano acio che diventano morbide. Et sappi che questa concia e meglio daprile et de magia che in tutto lanno et anco de setembre et de octobre. Et sappi che per le pelle piccole commo sonno dagnelli o de volpe se vogliano conciare cum la mestra dele grande cum tucti li modi sopradicti. Et sappi che la concia de pelle senza pelo se vole tenere tucti li modi sopradicti salvo che vogliano essere pellate le dicte pelle in calcina et poi

than all the rest of the year. Know also that the small skins, such as foxskins and lambskins, must be prepared with the maestra for the large skins, with all the before-mentioned operations. And in the preparation of skins without the hair, the above directions must all be observed, except that the hairs must be taken off with lime, and then the preparation must be applied in the same manner as for those with the hair, except that they must be rubbed much more with the hand, to give them a finer surface.

342. *The preparation of a skin.*—Take of roche alum in powder 2 oz., and 2 eggs well beaten, a good handful of flour, as much salt as is sufficient to salt down a pound of flesh, as much oil as would warm a dish of soup, and a large foglietta of warm water. Put into the water, first the alum in fine powder, then the flour, and then the salt, and mix these ingredients; then add the eggs and the oil, and stir the whole together while the water is hot, put in the skin from which the hairs have been removed, and stir and manipulate it well, taking it out, and putting it back into the water; then let it stand for a night or for 4 hours at the least. Take it out without stretching it, and you may then dry it, and beat it well with the hammer; afterwards rub it down on both sides with pumice stone and it is done.

343. *To make chamois-leather.*—Take skins that have had the hair taken off by lime, and wash them well in water; then take warm water, and put into it 5 oz. of roche alum to each skin, and an equal quantity of dough made with wheaten flour, and make a sort of gruel, into which put the skins, and then stir them about for a considerable time with your hands. Let them stand for a night, then take them out and dry them in the shade, and press them.

344. *To make chamois-leather, dressed on both sides.*—Take a round piece of wood, as thick as the thigh, and as long as a man is high, and place it up against the wall as the fellmongers do. And if you wish to prepare a kidskin quickly in one day, take the skin, which must be fresh, and lay it upon this piece of wood, and with the blade of a knife take off the hair and the

li da la concia ordinatamente commo quelle dal pelo ma vogliano essere piu remenate assa cum mano perche levano piu bella grana.

342. *Concia per una pelle.*—Havve alume de rocho in polvere once 2, doi ova bene dibatutj poi tollj uno bono pugno de farina cio e el fiore et tanto sale quanto bastasse per insalare una libra de carne et tanto olio quanto condisse una menestra et una bona fogliecta daqua calda et metti in la dicta aqua prima lo alumj bene subtili poi la farina et poi el sale et miscola bene poi metlice li ova et lolio et mista bene et quando laqua e calda metti dentro la pelle depilata et manegiala bene et strocila bene traendola et remitendola in la dicta aqua calda poi premila et remenela in la dicta aqua calda poi lassala stare per una nocte o 4 hore almancho poi la tra fora senza astirla et polla asciugare et remenala bene a la stroppa poi la pumicia da luno lato et laltro e de facto.

343. *Ad camussium faciendum.*—Summe pellas depilatas in calce et sint bene lotas in aqua demum habeas calidam aquam et in ea pone pro qualibet pelle oncias 5 aluminis rochi et tantumdem de pasta levata cum farina de frumento et fac ut fari-natam et intromicte pellas et dehinc inde diu manibus misce et permicte per unam noctem deinde extrahae et sicha ad humbriam et remena ad torquam.

344. *A fare camoscio cum nervo o senza nervo cioe scamosciato da omne parte.*—Tolli uno lingno retondo et grosso quanto la cossa et longo quanto l homo et al muro appoggialo commo fanno li conciatore de corrame. Et se volesci fare una pelle de capretto subtitamente in uno dj tollj la pelle che sia fresca et polla insuso questo ligno et cum una costa de cortello per

scarf-skin. And if it is a large skin, let it remain in lime as the fellmongers do when they wish to make leather of it, and then rest it upon the before-mentioned beam, and with the knife-blade take off the sinews, and wash the lime well off. Then take 3 fogliette of water, into which put $\frac{1}{2}$ oz. of roche alum and half a handful of common salt, set the water over the fire in order to dissolve these ingredients. Then add a little oil, and remove it away from the fire; and while the water is tepid, add to it an egg well beaten up, and mix it well in the water; then dip the skin into it 3 or 4 times, and each time let it dry a little, and the last time let it dry well, and then beat it with the wooden hammer.

345. *To make chamois-leather without fat.*—Take milk, fine flour, and oil washed with ley, that the skins may not be soiled, mix the whole together with hot water, and put the skins into this water for three days; then turn them over on to the other side for 3 days more; afterwards let them dry, and do not stretch them. When they are dry beat them with the hammer.

346. *To make good chamois-leather.*—Take for each skin 3 oz. of flour, one tumbler of milk, 1 oz. of butter, and a little wheaten bread, and wet the whole well together with a little ley, in order that the ingredients may be well incorporated; and if it is not sufficiently wet, add to it nothing but clear ley, and let it remain for 5 natural days, and then put it to dry, and beat it with the hammer.

347. *To make chamois-leather quickly.*—Take 1 oz. of white soap and distemper it with ley, and then put the skins into the ley for the space of 4 days; then dry them, and stretch them on a stick, and they will be white and soft.

348. *To make chamois-leather as white and soft as silk.*—Melt pork-fat in a pipkin, and then take warm water, and wet up flour with it, and add to it the pork-fat, and mix all well together; then take another pan, and spread out the skins in it, and take a bocale of milk, and pour it upon the skins, and then put in the above-mentioned preparation, and let the skins

forza de braccio li leva via el pelo et lo nervo. Et se fusse una pelle grande falla stare in calcina commo fanno li conciatore quando le voglano conciare per corame et poi lapoggia al dicto ligno et per forza de la costa li leva lo nervo poi la lava bene da la calcina poi tollj 3 fogliecte daqua et in la dicta aqua ce pone una oncia e meza dalume de rocho et mezo pugno de sale comuno et metti laqua al foco che se disfaccia le dicte cose et poi ce pone uno poco dolio et levalo dal foco et quando e tepida laqua et tu ce pone uno ovo bene dibatuto bene et mistalo bene in la dicta aqua poi ce metti la pelle 4 o 5 volte et da una volta a laltra lassala uno poco sciugare et lultima volta lassala bene sciugare poi la mette alo lavello o ala stroppa e de facto.

345. *A fare camoscio senza grasso.*—Ahvve lacte fior de farina et olio lavato cum ranno da capo acio le pelle non vengano machiate et mista omne cosa insiemj cum aqua calda et mette le pelle in la dicta aqua per 3 dj poi le revolge da laltro lato per 3 altre dj poi le pone asciugare et non le stirare et quando sonno sciuche et tu li da la stecha et stroppa.

346. *A fare camoscio bono.*—Piglia per cescuna pelle once 3 de fiore de farina et uno bichiero de lacte et una oncia de butiro et uno poco de pane de formento et distempera omne cosa insiemj cum uno poco de ranno da capo molto bene acio che le dicte cose se incorporano insiemj et se fusse poca concia non ce agiongiare se non de lo ranno chiaro et lassa stare per 5 di naturali poi lo pone a sciutare et dallj la stroppa.

347. *A fare camoscio brevemente.*—Recipe oncia j. de sapone bianco et stemperalo cum lo ranno poi mette le pelle in lo dicto ranno per spatio di quattro dj et poi le pone a sciutare poi le stira ala stecca et seranno bianche et morbide.

348. *A fare camoscio che sia bianco et morbido commo una seta.*—Tolli grasscia de porco et strugila in uno pignatto poi tolli aqua calda et distemperala cum farina poi ce metti la dicta grasscia et mista bene insiemj poi tolli uno altro vaso et stendice le pelle poi tollj uno bocale de lacte et metti sopra ale dicte pelle poi metti la dicta concia et fa che le pelle sieno

be well covered by it, and let them remain there for 5 days, and they will be white and soft.

349. *To make chamois-leather which will always remain soft.*—Take milk, barley meal, and oil, washed with ley to soften the skins, and mix it all together with warm water; then dip the skins in the mixture several times, and let them nearly dry each time. Afterwards leave them to dry in the shade, and beat them with the hammer.

350. *To make chamois-leather water-proof.*—Take for each skin 4 eggs, and a good quantity, that is, a good glassful of milk for each skin, and a little oil; beat it all up well together, then let the skins soak in the mixture for 7 days, and turn them over once a day. Let them dry, and beat them with the hammer.

351. *To make chamois-leather.*—Take the skins and soak them in water for 5 or 6 days, and then in warm water for one night; then remove them from the water, and take off the hair with a horse's rib, and sprinkle them well with clear water and let them drain a little. Next take roche alum in fine powder, and 2 eggs to each skin, and flour well bolted, with a little wheat, and mix all these ingredients well with hot water, like paste for fritters, and then put the skins into the mixture for 3 days. Then take them out, and let them nearly dry; then mix some brass well with warm water, into which put the skins for 3 days more. Then dry them well without stretching them, and beat them with the hammer, and they are done.

352. *To make chamois-leather from parchment.*—Take parchment and anoint it with olive oil, and rub it well with your hands, and afterwards mix soap with warm caustic ley, and dip the parchment in it, and rub it well in your hands until it is finished, and then press it.

353. *To make chamois-leather from parchment.*—Take the parchment and soak it in water for 3 natural days, then take it out and let it half dry, and do not stretch it at all. Then soak it in a pan of warm water, with a handful of bran in it, mix all well together, and let the mixture stand so for 2 days;

bene coperte da la concia et lassa stare per 5 di et seranno bianche et morbide.

349. *A fare camoscio che arestia morbido sempre maij.*—Ahvve lacte farina dorzo olio lavato cum lo ranno acio le pelle pigliano la morbidezza et mista omne cosa insiemj cum aqua tepida poi ce pone le pelle piu volte et lassandole apresso che sciucare da una volta a laltra poi le pone asciutare alombra et dallj la stroppa.

350. *A fare camoscio che arestia alacqua.*—Tolli 4 ova per pelle et lacte assa cioe uno bono bichier per pelle et uno poco dolio molto bene menato insiemj et poi ce metcj le pelle a molle per spatio de 7 di et omne di le remena subtusopra una volta et polle a seccare et dalli la steccha.

351. *A scamosciare le pelle.*—Havve le pelle et mettile a mollo in laqua per 5 o 6 dj poi le pone a molle in laqua tepida per una nocte poi le leva via dala dicta aqua et levalj via el pelo per forza duna costa de cavallo poi le sciaqua cum aqua chiara multo bene et poi le pone a scollare uno poco poi tollj alumj de rocho et sia bene subtile et doi ova per pelle et farina bene stacciata cum uno poco de formento et mista bene insiemj cum aqua calda ad modo de pasta da fritellj et poi ce metce le dicte pelle per spatio de 3 di poi le tira fora et lassale quasi sciutare poi tolli remola et mistala cum aqua calda bene poi ce pone le dicte pelle per 3 altri di poi le sciuta bene senza astirarli et dalli la steccha e de facta.

352. *Ad camussium de carta caprina faciendum.*—Accipe cartam pecudis et eam unge oleo comuni et duc cartam inter manus fortiter postea distempera saponem cum liscivo capitis tepido et intromicte dictam cartam et multum duc manibus quousque perficitur et etiam duc ad torquam sive steccam.

353. *Affare camoscio de carta pecorina.*—Havve la carta et mettila a molle nellaqua per 3 di naturali poi tirala fora et lassala quasi sciugare per mita et non la stirare de niente poi la pone a molle nellaqua tepida in uno vaso et mistace cum quella aqua tepida una pugnata de remola et mista bene omne

then take it out and wash it in 2 or 6 waters, or until it is washed enough, and squeeze it well. Then take a vase, and fill it more than half full with water, and add to it as much alum as you think necessary, according to the quantity you wish to make, and one or two eggs beaten up; and do it all in order: first putting the water into a pipkin, and heating it over the fire; then adding the alum, and when the alum is dissolved let it cool until it is tepid, and then put it into a clean shell, adding to it a little wheat flour and an egg or two, and mix the alum-water well with the other ingredients; then put the said parchment into it, and stir it well in the liquor. Then let it remain for 3 days, and let the said parchment be well covered with the preparation, and keep it free from dust or other dirt. Then take out the parchment and squeeze it well, and repeat the process; then put it to dry in the shade, but do not stretch it at all, and then beat it with the hammer, and it is done.

354. *To make chamois leather with sheep or kidskin parchment that has been written on.*—Take the parchment that has been written on, and soak it in a pan of water, so as to be well covered. Next take a piece or two of quicklime, according to the quantity of the parchment, and put it into the water and let it dissolve and remain in it one natural day, and then rub it well with the water, using your hand for this purpose, or rub down the written side with a piece of hard quicklime, and when the letters have disappeared put them into the liquor previously directed for preparing parchment that has not been written on.

355. *To make excellent chamois leather.*—Take the skin from which the flesh has been stripped inside and outside, and then daub it all over with flour and water mixed like paste for wafers, and let it remain some days, that is, for three days or more; then wash it well, and put it into a pan; then take a new glazed pipkin, fill it with water, and put it over the fire, that is, put for each skin one metadella of water, and one ounce and a-half of roche alum. Let the alum dissolve in the pipkin, then put an equal quantity of common salt, and when they are well dis-

cosa insiemj et lassa cusci stare per doi dj poi la tira fora et lavala a doi o 6 aque o tanto che sia ben lavata et spremuta poi tollj uno vaso et fallo piu che mezo daqua poi ce pone tanto alumj quanto tu credi che sia bastevile secondo la quantita che tu voli fare et uno ovo o doi dibatuto e falla ordinatamente in prima mecte laqua in una pignatta et falla scaldare al foco poi mete dentro lo alumj et quando lo alumj sera disfatto bene et tu la lassa tanto fredare che sia tepida poi la mecte in una concha necta poi li mecte uno poco de formento di smolglio et uno ovo o doi et mista bene la dicta aqua alumata cum le dicte cose poi ce mecte dentro la carta sopradicta et remenala bene in la dicta decotione et poi lassa stare per 3 dj et fache la dicta carta stia ben coperta da la dicta concia et stia in loco che non vi vada polvere ne altra brutura poi cava fora la dicta carta et spremila bene poi factj da capo et remenala bene intra le mano et poi la pone a sciutare alombra et non la stirare per viruno canto et poi li da la stecca e fatta.

354. *Affare camoscio de carte pecorine scripte o de carte de capretti scripte.*—Tolli le carte scripte et metile a molle in acqua in uno vaso tanto che siano bene coperte poi tollj una petra de calcina viva o doi secondo la quantita dele carte et metila in la dicta aqua et lassala bene sciogliere et stare uno di naturali poi le sfrega cum la dicta aqua et cum mano o vero tu le sfrega cum calcina soda disopra ala scriptura et poi che sonno andate via le lettere meteraile nella concia commo e dicto disopra de la carta caprina non scripta.

355. *A fare camoscio bonissimo.*—Pilglia la pelle bene scarinata dentro et de fora et poi la creta tucta de farina cum aqua ad modo de pasta da fare cialde et lassala stare alcunj dj cioe per di 3 o piu poi la lava bene et mectila in una concha poi habbj una pignata nova vitriata et impila daqua et polla al foco cioe mecti uno mezo daqua per pelle et mectj una oncia et meza dalumj de rocho per pelle poi mectj lo dicto alumj a disfare in la dicta pignatta et poi ce pone altratanto sale comuno et commo sonno bene disfacti et tu leva dal foco la dicta pignata et mecti

solved remove the pipkin from the fire, and pour the water in which the alum and salt were dissolved into a pan, and when it is just tepid add for each skin 3 or 4 eggs well beaten. Mix them well with the water, to which add a little flour well beaten with the other ingredients, and a little oil, less than the fourth part of a foglietta to each skin, and mix all well together; then put the skin into the liquor and stir them well in the preparation; let them remain in it covered closely for 3 days. Then take out the skins, and squeeze them well one by one, and then rub them in your hands one at a time in order, and put them to dry sheltered from sun, wind, or smoke; then beat them with the hammer.

356. *To make a preparation for chamois leather, good, and true, and tried.*¹—Take dry skins well seasoned and from healthy beasts, and put them into a tank of water to soak for 3 days, and then wash them well in the tank from all dirt that may hang about them, and when they are well washed throw away the water. Then take fresh quicklime, and put it into the tank, and mix it well with water, and when the quicklime is well slaked and dissolved so that it is very thin and liquid, put the skins into it one by one, continually stirring the lime water, and let them remain in soak for three or four days, more or less, according to the state of the skins, and until the hair comes well off. Once every other day, or every day at the most, take them out of the lime water, and hang them over the tank for an hour to drain; then put them back into the tank, and when the hair comes well off, lay them to drain well in a trough for two hours. Then take a beam supported on two feet, and lay the skins upon it in order, one upon another, and then take a crooked stick of the shape of a horse's rib, and scrape the hair with the stick from each skin, and when the hair is all stripped off, put them back to soak in the tank containing the lime and water for 16 or 20 days, and every other day stir them about well in the lime water; after 16 or 20 days take them out, and carry them to a running

¹ This recipe is distinguished in the original by a hand drawn in the margin.

laqua alumata et salata in una concha et commo la dicta aqua e divinuta tepida et tu ce mectj 3. o 4 ova per pelle bene dibatutj et mistalj bene cum la dicta aqua et poi li mecte uno poco di formento disfacto bene cum la dicta aqua et mective uno poco dolio cioe manco che el quarto duna foglietta per pelle et mistica bene omne cosa insiemj poi ce pone le pelle et menale bene per la dicta concia et lassa stare per 3 dj le dicte pelle bene coperte dala dicta concia et passati i tre dj cava fora le dicte pelle et spremilj bene ad una ad una poi le remena per mano ad una ad una ordinatamente poi le pone a sciutare in loco che non habia ne sole ne vento ne fume et ponele ala stroppa o stecca.

☞ 356. *A fare concia in camoscio bona et vera et probata.*— Tolli le pelle stagionate et non sieno de bestie insane et sieno le pelle seche et metilj in uno mastello daqua a molle per tre dj poi le lava molto bene in lo dicto mastello da omne immunditia che le pelle havessaro et commo sonno bene lavate gietta via quella lavatura poi tollj calcina nova et viva pollo in lo dicto mastello et distempera la dicta calcina cum aqua molto bene et commo la calcina e ben disfatta et disolta et che ella sia ben brodosa et liquida et tu ce pone dentro le dicte pelle ad una ad una sempre remenando la dicta aqua et calcina et lassale stare a molle li dentro per 3 di o 4 o piu o meno secundo le pelle et per infino a tanto che se pelano bene. Et omne di o vero omne doi di al piu le cava fora una volta da la dicta aqua et calcina et polle sopra alo dicto mastello per una hora a scolare poi le ritorna dentro in lo mastello commo prima et commo se pelano bene et tu le pone a scolare in una caviglia molto bene per doi hore poi habbi uno cavalleto da doi pei et metlice suso le dicte pelle ordinatamente luna sopra laltra poi tollj una bastone retratto in forma duna costa de cavallo et mandato giuso el pelo cum lo dicto bastone molto bene a pelle per pelle poi che sonno ben pellate remectile a molle in lo dicto mastello dove te rimase la dicta aqua et calcina per spatio de 16 o 20 di et omne capo

stream, and wash them and squeeze them well, to remove the lime from them. And when they are well washed and clean, throw away the lime and water from the tank, wash it very clean, and pour into it as much lime water as you think will just soak the skins, and then put into it sufficient bran to make the warm water pretty thick. Put the skins, when well washed, one by one into the bran and water, and let them remain so for 3 days; then take them out and wash them in a running stream to remove the bran, and afterwards carry the skins well washed to a ladder or a trough, and then take the skins one by one and wring and squeeze them well so that there may not remain any water in them, and the better they are squeezed and pressed the whiter they will become. And if in pressing the skins any bladders should form, prick them with a needle in order that the water may drain out; and when the skins have well drained, and have been all squeezed separately, smooth the skins one at a time by pressing the hand all over them, and lay them one upon another well stretched at the neck, at the shoulders, and all over the skin, and then make the tank very clean, and put into it as much tepid water as you think the skins will well bear, and rather more than less. Then take an ounce of roche alum well pounded, and an equal quantity by weight and not by measure of pounded salt, and $\frac{1}{2}$ oz. of gum arabic well pounded; put the powders into the tank with the tepid water, and mix them well in order to dissolve them; then take the skins one by one well stretched out, and dip them into the water in which the powders are dissolved, pressing them and dipping them, and stirring them well, that they may soak up more of the alum water, and do this to each skin separately, and when the skins are well stirred and soaked put them to drain for an hour, and let the drippings fall into the water in which the skins were dipped. Then take as much flour as you think sufficient for the skins, and wet the flour with the drippings of the skins which you reserved, and distemper it so that it may be like paste for making fritters. Add to the paste an ounce of oil, or one egg for each skin, and know that when you mix

de doi di le remena molto bene in la dicta aqua calcinata de poi 16 o 20 dj et tu le cava fora et portale alaqua corrente et lavale et spremile molto bene acio la calcina escha fora. Et commo sonno bene lavate et nectj tolli lo dicto mastello et gietta via quella aqua et calcina et lavallo per modo che sia bene necto et metrice tanta aqua tepida chiara quanto tu crede che le pelle possano ben stare a molle poi ce pone dentro tanto de remola grossa che la dicta aqua tepida vengna uno poco spessa poi tollj le dicte pelle ben lavate et metile dentro in la dicta aqua remolata ad una ad una et cosi le lassa stare per 3 di poi le cava fora et lavale molto bene alaqua corrente acio tucta la remola vada via poi porta le pelle bene lavate ad una scala o vero ad una caviglia poi tollj le dicte pelle ad una ad una et dallj lo torcholo et premile bene che non ce rimagna niente daqua et quanto seranno meglio spremute et atorcolate tanto piu bianche viranno. Et se in lo torcolare le pelle facessero alcune vesiche apuntale et forale cum uno acho acio la pelle se possa bene scolare dalaqua et commo le pelle sonno bene scolate ad una ad una et bene spremute de vantagio stendile cum le mano per tuta la pelle ad una ad una et pone luna pelle sopra laltra ben distesa al collo a le branche et per tucta la pelle poi tollj lo dicto mastello bene necto cum tanta aqua tepida quanto tu poi comprehendare che le dicte pelle possano bene ricevere et innanze piu aqua che meno poi tollj una oncia dalumj de rocho bene pisto cum altrettanto de sale pisto a misura et non a peso et meza oncia de gomarabica bene pista poi pone le dicte polvere in lo dicto mastello dove e la dicta aqua tepida et remistale bene acio se disolvano poi tollj le dicte pelle ad una ad una bene stese et metile in la dicta aqua tepida dove sonno disolute le dicte polvere spremendole et reimbeverandole et remenandole bene acio pigliano meglio quella aqua alumata et cusci fa a pelle per pelle et commo le pelle sonno ben remenate et et imbeverate et tu le pone a scolare per una hora et ricoglie la scolatura sopra alaltra aqua che te remase de le pelle poi tollj farina a fiorata tanta quanta te pare bastevij ale pelle et distempera la dicta farina cum la dicta scolatura dele pelle che riservasti et dis-

the flour, the drainings must be tepid and not hot. Mix them well together, then take the skins one by one and put them into the paste or composition, and let them remain for three natural days at the most; then take the skins just as they come, without stretching them at all, and put them to dry upon a string in the shade, and as they dry you must stretch them, and then beat them with the hammer, and rub them well with your hand that they may have a finer surface, and the work is done. And know that each kidskin, and skin of the same size, requires the alum and the other things of the weight above given. And if the skins are those of sheep, or goats, or such like, they require 3 oz. of alum and 3 oz. of oil, or 3 eggs and 1½ oz. of gum arabic for each skin. Follow the recipe as above directed.

357. *To dye silk or cloth red.*—Take 1 lb. of silk, and 4 oz. of soap, and put them into a cauldron with water, and let it boil until you see the silk appear starred. Then take it out, and wash it well in clear water until the silk becomes white; drain it well, and wring it with your hands, and then spread it out, and this is done when the silk is not boiled. Then take 4 oz. of alum in another small vase and boil it, and dissolve it in clear water, and when it is dissolved take another larger vase, and fill it with fresh water, and put the alum into it, and then put in the silk, and let it remain 3 days and 3 nights, and then wash it and stir it about well in fresh water, wringing it well with your hand until the alum is washed out. Then take a kettle of fresh water, and 3 oz. of powdered verzino, and let it boil until reduced one third; then fill it up with fresh water, and boil it again till reduced one finger's breadth. Then take it off the fire and divide the water into two portions, and into one of these put the silk and let it stand till it is cold. Then wring it with your hand, and put it back into the other water which you reserved, and let it be as hot as you can bear

temperala per modo che sia commo pasta da fare fritelli poi pone in la dicta pasta una oncia dolio per pelle o vero uno ovo per pelle et sappi che quando tu distempere la dicta farina la scolaratura vole essere tepida et non calda et mistica bene insiemj poi tolli le dicte pelle ad una ad una et metile in la dicta pasta o compositione et lassale stare per 3 di naturalj al piu poi tolli le pelle commo le venghano senza extirarle de niente et polle in su una corda a secare alombra et commo se venghano secando cusci le vienj stirando poi le pone ala steccha et remenale bene per mano acio levano piu bella grana et diventano piu morbide e de facto.

Et sappi che omne pelle de capretto o similj a quelle vogliono lo alumj et laltre cose al peso dicto de sopra. Et se fussaro pelle de castrone o capre o altre simili vogliono 3 once de alumj per pelle et cusci 3 once dolio o vero 3 ove per pelle et una oncia et $\frac{1}{2}$ de gomarabica et seguita la recepta alo sopradicto modo.

357. *A tegnare sirico o drappo rosscio.*—Tolli una libra de sirico et 4 once de sapone et metilo in uno caldaro cum aqua et bolla per infino che vede aparere lo sirico ad modo de stellucie da poi trallo fora et lavallo ben in aqua chiara per infino che lo sirico sera facto bianco et scolalo bene et torcilo cum mano dapoi lo stende. Et questo se fa quando lo sirico non e cocto. Ma poi tolli oz. 4 dalumj in uno altro vaso piccolo cum la bolutione et strugilo in aqua chiara commo e structo tollj uno altro vaso magiore et impilo de aqua chiara et metcj dentro lo dicto alumj et poi ce pone lo dicto sirico et stia li dentro tre di et tre nocte poi lo lava et rimenalo bene in aqua chiara torcendolo bene cum mano tanto che quello alumj escha fora poi tollj uno caldaro cum aqua chiara et tolli 3 once de verzin trito et fallo bollire tanto che arentra per terzo poi reimpe lo dicto vaso daqua chiara et bolla de novo tanto che calli uno deto poi levalo dal foco et parte per mezo la dicta aqua de verzin et in una de queste parte ce pone lo dicto sirico et lassa stare per infino che se refreddj de poi lo torce cum mano poi lo repone in laltra aqua che reservasti et sia tanto calda che tu ce possce

your hand in it. Then drain it and wring it well, and spread it out in the sun and it will be fine.

358. *To dye silk or thread saffron coloured or yellow.*—Take 1 lb. of silk and 4 oz. of soap, and boil it until it gives the before-mentioned sign of little stars, and then distemper it with 4 oz. of alum as before and put the silk into it, and let it remain in soak for 1 natural day. Then draw it out, and do not let it be stirred or washed in the water, but take it out and dry it in the sun so as not to crease it. Then take 2 lbs. of “herba roccia,” called also “panicella,” and put it to boil in a cauldron until it is well boiled and prepared, and then take a vase, and put fresh water into it, and an equal quantity of the decoction of this herb, and let both these waters be so hot that you can but just bear your hand in them. Then put in the silk and let it soak for 3 or 4 hours; then wring and put it back two or three times into the decoction, which must be tolerably hot, and without any other mixture, and then spread it out to dry.

359. *To dye silk or thread purple.*—Take 4 oz. of soap and boil [the silk] as before directed, until it appears starred, and let it be washed in clear water, and then be spread out; then take a vase with clear water, and put into it 2 lbs. of oricello to every pound of silk, if the oricello is good; if the oricello is not very good, put 3 lbs. of it into a cauldron for 2 hours, and let the fire be moderate; then let it cool, and wring it well, and put it into a very clean woollen cloth and squeeze it well, and let it remain so for 3 days, and then wash it well in clear water, wring it, and then stretch it out in the shade, and when it is dry roll it up in a white linen cloth tolerably tight.

360. *To dye silk or thread violet.*—Take 2 or 3 lbs. of oricello, and divide it into two portions, and put one part of it into water to boil with the silk, and let it boil for an hour; then draw out the silk and stretch it out, and fold it up; afterwards put the other half of the oricello to boil together with the former portion until there remains but a very little water.

patere la mano poi lo scola et torcilo bene et stendilo al sole et sera bello.

358. *A tegnare sirico croceo o vero giallo o refe.*—Havve una libra de sirico cum 4 once de sapone et bolla tanto che facia lo sopradicto signale de stellucie dapoi distemperalo cum 4 once dalumj commo e dicto desopra et metcj dentro lo sirico et stia a molle per uno dj naturali poi tiralo fora et non sia remenato nella dicta aqua ne lavato ma sia tracto fora et steso al sole per modo che non se intriche poi tolli doi libre de herba roccia cio e panicella et metila a bullire in caldaro per infino che sia ben cotta et confectata poi tollj uno vaso et metice aqua chiara et altrettanta aqua de la cocitura de la dicta herba cotta et tucti doi quelle aque siano ben calde che tu ce possce patere la mano poi metcj dentro lo sirico et stia a molle per 3 o 4 hore poi lo torce poi doi o 3 altre vole metcj lo sirico a molle in la dicta aqua cotta et sia ben calda senza altra mistura poi lo stende a sciutare.

359. *A tegnare sirico pavonazzo o refe.*—Ahvve once 4. de sapone et cocilo commo e di sopra dicto che apare certe stellucie et sia lavato in aqua chiara et poi sia steso poi tollj uno vaso cum aqua chiara et metice doi libre de rogello per una libra de sirico se lo rogello e buono se non fusse troppo bono meticene 3 libre et fa bene bollire cum lo sirico in uno caldaro per doi hore et sia lo foco temperato et poi lo pone a fredare et poi torcilo bene et metilo in uno panno de lana bene necto et stringilo bene et cusci lo lassa stare per 3 dj poi lo lava bene in aqua chiara et torcilo bene et poi lo stende alombra et commo e sciutto metilo in uno panno de lino bianco ordinatamente stricto.

360. *A tegnare sirico violato o refe.*—Tolli doi o 3 libre de rogello et partilo per mita et una parte sia messo in aqua a bullire cum lo sirico et bolla per una hora poi tira fora lo sirico et sia steso et revoltato dapoi sia messo laltra mita de rogello a bollire insiemj cum lo sopradicto per infino che aremanga uno poco daqua poi levalo dal foco et stia lo sirico in quella

Then take it away from the fire, and let the silk remain in that water to cool for one natural day. Then wring it and wash it with clear water and let it dry in the shade, and then put it into a linen cloth rolled up tolerably tight as before.

361. *To dye silk and thread black.*—Take $\frac{1}{2}$ lb. of galls well crushed, and boil them in a cauldron with water, until they are well boiled, and then put in the silk to boil in the decoction of galls for half an hour. Then take it out and let it dry in the sun or in the wind, and then take 3 pitchers of shoemaker's blacking, and 1 pitcher of the decoction of galls, and two petitti of dust from a grindstone, and mix the whole together and make it boil for an hour. Then let it cool and clear very well, and then separate that clear water from the lees in another vase, and add an ounce and a half of well pounded vitriol and set it to boil, and when it has boiled for the fifth part of an hour, add to it half a glass of common oil, and then put in the silk to boil for half an hour. Then remove it from the fire and let it remain so for a day and a half, and then take it out and wash it in clear water and wring it well, and spread it out in the sun, and this dye as long as it lasts is good for dyeing. And know that the silk must be always boiled, and if it has not been boiled it cannot be dyed; and it must be boiled in the before-mentioned manner with soap. And the silk that has not been boiled is distinguished in the following manner from the silk that has been boiled. Put the silk into your mouth and chew it a little, and let it be wet with the saliva, then rub it with your fingers; if it rustles while it is wet it is not boiled.

362. *To dye silk or thread green.*—First make the silk yellow with "panicella" as was before directed for yellow silk, and then take 1 lb. of silk and 4 oz. of indigo, and put it into a saucepan with a little water to boil for half an hour or less, and then take it away from the fire, and cover it for half a day with a cloth, and if the indigo is not dissolved, rub it up with your fingers in the water, and let it clear itself; then separate the water from the lees, and put the water into a vase that is

poca daqua a refredarse per uno dj naturalj poi sia torto et lavato in aqua chiara et pollo a sciucare alombra poi metilo in uno panno de lino agullupato competentemente stricto commo e dicto desopra.

361. *A tegnare sirico negro o refe.*—Piglia lb $\frac{1}{2}$ de galla bene amachata et cocila in uno caldaro cum aqua che sia cocta bene poi mecte dentro lo sirico a bollire in nella dicta aqua gallata per meza hora poi lo tira fora et pollo a sciutare al sole o al vento poi tolli tre brocche de tenta da calzolare et una broccha de quella aqua gallata et tolli doi petti de loto de rotta et mista omne cosa insiemj et fa bullire per una hora poi lassala refredare et multo bene reschiarare et poi sepera questa aqua chiara dale fecce in uno altro vaso et in questa aqua chiara mecte una oncia e $\frac{1}{2}$ de vitriolo ben pisto et pollo a bullire et commo ha bollito per uno quinto dhora et tu ce mectj mezo bichiero dolio comuno poi ce mectj lo sirico a bullire per meza hora poi tollj via dal foco et lassalo cusi stare per uno di et mezo poi tiralo fora et lavallo in aqua chiara et torcilo bene poi lo stende al sole et questa tenta dummentre che ella dura e bona per tegnare. Et sappi che lo sirico deve essere sempre cocto et se non fusse cocto non se poria tegnare et cocilo in lo modo sopradicto cum lo sapone et quando lo sirico non fusse cocto se cognosse in questa forma da lo sirico che e cocto se vole mectare lo sirico alla bocha et masticarlo uno poco et fa che sia bagnato cum la saliva et da poi lo sfrega cum li deta et se quella bagnata stride non e cocto.

362. *A tegnare sirico verde o refe.*—Prima fa lo sirico giallo cum panicella commo e disopra dicto de lo sirico giallo poi tollj una libra de sirico once 4 de indico et metilo in uno caldareto cum poca aqua a bullire per meza hora o manco poi tola dal foco et coprila per mezo di cum uno panno et se lindico non fusse desfato atritalo cum li deta in la dicta aqua et lassa reschiarare poi sepera laqua chiara dale fece poi mete la dicta aqua in uno vaso che sia bono da tengiare et quando tu

fit for dyeing. And when you wish to dye it, take the solution of indigo and put it to warm, and when it is hot, take a lump of quicklime as big as an egg, and half a pound of honey, to every pound of indigo. Then put one-third part of the lime into the water, and when it is hotter, put in another third part, and when it is nearly boiling, add what remains, and then remove the water from the fire, because if it were to boil, it would boil over the saucepan. Then pour the decoction into a vase, and let it be well covered over like a stew, and when it is cool enough to bear your hand in, put in gently the yellow silk, which must have first been dipped in fresh water and well wrung. Then put it into the solution of indigo, and warm it gently, and if it is but slightly coloured put it back again into the dye, and you may repeat this several times with the dye as long as any of it remains, if you preserve it; and when you wish to dye anything, put in fresh indigo and honey, but not in such quantity as before.

363. *To dye silk a dark green.*—Take the silk dyed with a purple or violet colour; and when you have taken it out, dip it in alum, and then dye it with “panicella,” as was before directed for a yellow dye; and when it is so dyed, you will do as before directed for a green colour, and you will have a dark green.

364. *To dye silk or thread blue.*—Take the silk boiled and washed as before directed for boiling silk white and without alum, put it into the indigo-dye, and you will have a fine light blue.

365. *To dye red.*—Take for every pound of thread 3 oz. of roche alum well ground, and put the alum into a vase with water over the fire; and when it has boiled a little, put the thread into it, take it off the fire, and let the thread remain soaking in it until it is cool. Then take it out and wash it well until the water comes off clear; and take 1 oz. of verzino in powder, either scraped or rasped, and pour water upon it, and boil it for an hour and a half. Then remove it away from the fire, and strain it through a linen cloth; then first set the strained liquor to boil, and when it is nearly boiling put the

vole tegnare tollj la dicta aqua indicata et metila a scaldare havj poi che e calda una zuppa commo uno ovo de calcina viva et meza libra de mele per libra de indico et poi metj in la dicta aqua la terza parte de quella calcina et quando sera piu calda metj laltra terza parte et quando sera per bollire metice laltra vanza et allora remove la dicta aqua dal foco perche se bollisse usciria fora del caldaro et metj la dicta bullitione in uno vaso et stia bene coperta ad modo duno stufo et quando sera tanto fredda che tu ce posse patere la mano pianamentj metice lo dicto sirico giallo e bagnato in nelaqua chiara prima et bene spremato poi lo mete in la dicta aqua indicata et calda pianamente et se havesse poco collore de novo lo remectj in la dicta tinta et cusi potrai fare piu fiata cum la dicta aqua per infino che durara se tu la conserve et quando tu volesti tegnare renova la calcina et lo mele et non in tanta quantita quanto prima.

363. *A tegnare lo sirico verde scuro.*—Ahvve lo sirico tento in collore pavonazo o vero violato et tracto che laj fora tingilo in lo alume poi lo tegne cum la panicella commo e dicto de sopra in lo colore giallo et cosci tinto farai commo e dicto disopra in lo colore verde et haverai verde scuro.

364. *A tegnare lo sirico in turchino o refe.*—Tolli lo sirico cocto et lavato commo e dicto desopra dela cocitura de lo sirico cosci bianco et cocto senza alume commo e dicto desopra metilo in la dicta aqua indicata et haveraj bello turchino.

365. *A tegnare in roscio.*—Havve per omne libra de refe once 3 de alumj de rocho bene trito et metj lo dicto alume in uno vaso cum laqua al foco et commo ha bullito uno poco et tu vi metj dentro lo refe et levalo dal foco et lassa cusci stare lo refe nel bagno fino che se fredda poi lo tira fora et lavallo bene per infino che nesci laqua chiara poi tollj once j. de verzino in polvere o raso o raspato cum la raspa et metice suso de laqua et fallo bollire per una hora et $\frac{1}{2}$ poi lo leva dal foco et colalo cum uno panno de lino poi pone la dicta collatura a bullire et quando sera per bollire et tu ce pone lo dicto refe et lassalo

thread into it, and let it boil for an hour, and then take out the thread and put it upon a stick to dry. Next add to the liquor which remains one glassful of very strong ley for each pound of thread, and stir the liquor well, in order for it to unite with the ley, and then return the thread into it and boil it for a quarter of an hour; afterwards stretch it out to dry in the shade, and it will be fine.

366. *To dye thread with verzino.*—Take verzino, and boil it in water as long as you think sufficient, and then take the thread and gall it well; afterwards wash it in fresh water, and then alum it, and let it nearly dry; warm the verzino, and dip the thread several times into the dye to colour it, and dry it well in the shade.

367. *To dye thread red.*—Take some madder well pounded, and put it into a little ley made from vine ashes, and let it boil, and put the thread to boil in the ley for some time; then remove it from the fire, and let it dry; when it is dry alum it, and then boil it in a little verzino well boiled with water and ley mixed together; then dry it in the wind without sun, and it will be fine.

368. *To dye silk black.*—Take soot, and scrapings of boilers, and well rusted iron, and boil these ingredients in red wine till reduced more than one-half, and when it has become tepid, put in the thread well dipped and dried several times in the dye, and it will become fine black thread.

369. *To dye cotton or silk black.*—Take 1 lb. of iron filings, 2 oz. of galls well pounded, $1\frac{1}{2}$ oz. of Roman vitriol, rinds of pomegranates, bark of the roots of walnut-trees, 2 oz. of verzino well ground, and strong vinegar; boil all together until reduced to one-fourth, and let the decoction cool, and put it in the sun for 3 or 4 days, stirring it 8 or 10 times every day. Then strain it, and when you wish to dye silk or cotton set the decoction to boil, and boil the silk or cloth in it for a quarter of an hour; then dry it in the shade, and the more you dip it, the finer and more beautiful it will be.

370. *To dye cotton cloth.*—Take 5 lbs. of galls well pounded,

bullire per una hora poi cava fora lo dicto refe et pollo sopra uno bastone che se sciuta poi metj in lo dicto bagno che te aromasto uno bichiero de ranno fortissimo per cescuna libra de refe et mista bene lo dicto bagno acio se incorpora cum lo ranno poi tornalj lo dicto refe et ponalo abullire per uno quarto dhora et poi lo pone asciugare alombra steso et sera bello.

366. *A tegnare refe in verzino.*—Tolli verzino et cocilo in aqua tanto che te paia che sia bastevile poi tolli lo refe et gal-lalo bene et poi lo lava alaqua chiara poi lo aluma et lassalo quasi sciutare poi scalda lo verzino et mette a tegnare lo refe piu volte in la dicta tenta et sciugalo bene alombra.

367. *A tegnare refe in roscio.*—Ahvve uno poco de robbia bene pista et metila in uno poco de ranno facto de cenere de vite et fallo bullire et metti lo refe a bullire in lo dicto ranno per una peza poi lo leva dal foco et pollo a sciutare commo e sciuto et tu lo aluma poi lo pone a bullire in uno poco de ver-zino bene cocto cum aqua et ranno misto insiemj poi lo sciuca al vento senza sole et sera bello.

368. *A tegnare in nero lo refe.*—Tolli fuligini raditura de caldaro et ferrj bene aruginatj et fa bullire queste cose in vino vermiglio piu che per mita et quando sera divinuto tepido et tu ce pone lo refe bene callato et sciucho piu volte in essa tinta et vira bello refe nigro.

369. *A tegnare guarnello o seta in nero.*—Ahvve una libra de limatura de ferro once 2 de galla bene pista once j et $\frac{1}{2}$ de vitriolo romano scorze de mele granare scorze de radice de noce poi tollj once 2 de verzino ben trito poi tollj aceto bianco forte et fa bullire omne cosa insiemj tanto che torna per quarto et poi lassa fredare pone la dicta decotione al sole per 3 o 4 dj et omne dj lo mista 8 o x volte poi la cola et quando tu vole tegnare metti a bulire la dicta decotione et metice la seta o panno a bullire dentro per uno quarto dhora et poi lasciuta alombra et commo piu ce la metera piu se fara bella et piu fina.

370. *A tegnare guarnello.*—Tolli galla bene pista lb 5 et

and put them into hot water with 10 lbs. of "pignolato,"¹ and then add 5 lbs. of Roman vitriol well pounded, and mix the whole well together, and let it stand a night, and it will be good.

371. *To dye bones green.*—Mix finely powdered verdigris with the very strong vinegar, and put white bones into a vase closely covered, warm them a little, and they will become green.

372. *To dye bones red.*—Take verzino scraped, and put it into a glazed jar, and pour urine and ley upon it; then dip bones into it, and they will be red.

373. *To dye skins a light grey.*—Take 12 bocali of water and 3 oz. of galls well pounded, boil until reduced one-third, and then strain the liquor, and add 6 oz. of Roman vitriol to the decoction of galls, and dye the skins. And if you wish to have a dark grey add to it a bocale of ley, one glass of oil, and boil it, but the vitriol must not be boiled.

374. *To make good 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 the fresh bark of mountain ash scraped with a knife, and one handful of fresh bark of roots of walnut trees, and 2½ oz. of gum arabic; mix the whole together with the wine, and let the mixture remain for 6 or 8 days in the sun, stirring it well 4 or 6 times every day. Then add 2½ 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 a good and perfect writing ink.

375. *To dye bones of oxen, buffaloes, and goats, of all colours inside and out.*—Put the bones into strong vinegar, and let them remain for 7 days; then boil them with that vinegar until reduced to one-half. Add to them the colour with which you wish to dye them, and boil it with them; then put in a little sal-

¹ Guarnello is a kind of cloth made of cotton, but the term is also used

polla in aqua calda poi ce pone lb x de pignolato poi ce pone lb 5 de vitriolo romano bene pisto et mista bene insiemj multo bene et lassa stare una nocte et sera bono.

371. *A tegnare losso in verde.*—Capias acetum acerrimum viridem erem subtilissimum et pone in dicto aceto et intus pone ossa alba in aliquo vaso bene coperto et aliquantulum calefac et efficitur viridis.

372. *A tegnare losso in rosscio.*—Tolle verzinum rasum et pone in olla vitriata et intus pone de hurina et de liscivio et intus pone de omissis et fient rubeis.

373. *A tegnare pelle in bretino chiaro.*—Tolli 12 bocalj daqua et once 3 de galla bene pista et fa tanto bullire che arentre per terzo et poi la cola et tolli once 6 de vitriolo romano et metilo in la dicta aqua gallata et poi tegne le pelle. Et se volesci bertino scuro metice uno bocale de liscia uno bichiere dolio et metti a bulire ma non vole bulire el vitriolo.

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 $\frac{1}{2}$ de goni arabico et mistica omne cosa insiemj cum lo supra dicto 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 $\frac{1}{2}$ 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 poi lo cola et metilo doi dj al sole et se ce metj poi uno poco dalumj de rocho farallo piu lustro assa et vira perfecta et bona intinta da scrivere.

375. *A tegnare ossi bovini bufalini et caprini dentro et di fora in omne colore.*—Abeas de forti aceto et ossa miete intus et ibi dimicte stare per septem dies demum fac bullire cum illo aceto usque ad medium et quem colorem vis colorare pone intus cum ipsis ad bulliendum deinde pone intus cum omissis aliquan-

to denote a woman's dress made of this material. Pignolato is a sort of cloth made of linen or hemp.

ammoniac with the bones, and let them boil until they are coloured inside and out.

376. *To dye box wood black.*—Take box wood, and leave it for a night in oil and sulphur, then boil it for an hour, and it will be as black as coal.

377. *To dye bones green.*—Put bones well cleaned into a vase full of ley, with goat's milk and verdigris very finely powdered; cover the vase closely, and bury it in dung for the space of 10 days, and the bones will become green inside and outside.

378. *To make a cement which will resist water and oil.*—Take liquid varnish $\frac{1}{2}$ oz., raw ceruse, very white quicklime, and white of egg, each $\frac{1}{2}$ oz., and incorporate them together, and cement what you please.

379. *A wonderful cement for crystal and gems, and for stone and wood.*—Take ceruse and grind it up well with varnish, cement what you please, and dry it in the sun.

380. *To make a cement to fasten on gems.*—Take two parts of powdered vitriol, 1 part of mastic, 4 parts of pitch, and melt them together, and they will form a very strong cement.

381. *To make a cement for vases.*—Take the yellow earth of the apothecaries, a little orpiment in powder, a little quicklime, and a little liquid varnish, and put all into a pipkin, mixing the ingredients together over the fire, and, while hot, cement what you please.

382. *To make a cement for vases in another way.*—Take liquid varnish, ceruse, and a little Armenian bole, to make the cement more tenacious, grind the whole together, and cement what you please.

383. *To make a cement for wood work.*—Take of Greek pitch 2 parts, pounded bricks, and a little mastic, and grind the whole up well, and then with a hot iron cement whatever you like.

384. *To soften bones.*—Take common salt and Roman vitriol in equal quantities, and grind them very well together; then distil them through an alembic, and keep the distilled water in

tulum de sale armoniaco et dimite tantum bulire quod habeat illum colorem intus et extra.

376. *A tegnare bosso in nero.*—Recipe bussum et eum permicte in oleo cum sulfure per unam noctem et postea permicte bullire per horam unam et fiet nigrum ut carbonem.

377. *A tegnare ossa in verde.*—Ttolli losso ben pollito et metilo in uno vaso pieno de ranno et de lacte de capra et de verderamo bene subtili et copri bene lo dicto vaso et metilo socto lo litamj per spatio de x dj et sera facto verde dentro et de fora.

378. *A fare colla che tene aqua e olio.*—Ahvve vernice liquida oz. $\frac{1}{2}$ biacca cruda clacina viva et bene bianca et chiara dova ana oncia $\frac{1}{2}$ et incorpora insiemj et incolla quello che tu volj.

379. *Mirabilis colla ad christallum gemmas et super petram vel lignum.*—Accipe ceruse et confice cum vernice bene et incolla quicquid vis et dimite secare ad solem.

380. *Ad fatiendum collam ad gemmas retinendas.*—Summe vitrioli pulverizati partes 2, masticem partem j. picis partem 4 et insimul distempera et erit colla fortissima.

381. *Affare colla per vasa.*—Tolle terra gialla da li spitali et uno poco doropiumento in polvere et uno poco de calcina viva et uno poco de vernice liquida et metti omne cosa in uno pignatino et mista molto bene sopra al foco et incolla cusi calda quello che te pare.

382. *A fare colla per li vase per altro modo.*—Ttollj vernice liquida cerusa et uno poco de bollarminio perche sia piu tenace et macina omne cosa insiemj et incolla quello che te piace.

383. *A fare colla per lignamj.*—Ahvve pece greca parte 2 polve de matone et uno poco de mastice et macina bene insiem poi incolla cum uno ferro infocato quello che tu volj.

384. *A mollificare losso.*—Tolle sale comuno vitriolo romano ana et macinalj insiemj molto bene poi distilla per lambico et serva laqua distillata ben turata. Et quando vorai mollificare

a vessel well closed. When you wish to soften bones or horn or ivory, put them into the said water for the space of 5 hours, and it will soften so that you may impress on them what you like, and they will afterwards become hard as before.

385. *To make fish-glue.*—Take the bones of a pike or of any other large fish, dry them, and reduce them to powder in a bronze mortar; then put the powder into a new pipkin, with as much water as you think sufficient for the bones or dust, and make the water boil until the bones are liquefied; then touch the water with your fingers, and if they stick together it is good and perfect. Then take it from the fire, and strain it through a linen cloth, let it cool, then cut it into pieces, and dry it in the wind without dust.

386. *To prime panels for painting on.*—Take the panels and give them 3 or 4 coats of very hot glue; after each coat let them dry tolerably, but let the last coat dry perfectly. Then take gesso in fine powder and well ground, so as to be very fine; distemper it with warm water, and lay it upon the panel with a stick, and let it dry; then scrape it, that is, scrape off the rough parts with a knife blade. Then take gesso sottile, with very clear size, not too strong, and lay it ten times, if necessary, with a paintbrush upon the first coat of gesso; and, when it is dry, rasp it very thin, and draw upon it if you like with soft charcoal of willow or vine; and if you do not like that, take a goosequill and put the charcoal into it so as not to soil your hands. And if you wish to gild it, take Armenian bole ground very fine with white of egg, which is to be diluted with one cupful of pure water, and beaten for one hour; grind the Armenian bole very fine, and lay it on wherever you wish to gild, not twice only, but even so many as eight times, continually adding Armenian bole, until the priming is very thick; and so you will have what you want. Wet the part you wish to gild twice with clean water, lay on the gold, and remember to let it remain for one hour, and then burnish it.

387. *To soften bones.*—Put the bones into ley made with quicklime and baked ashes in equal quantities, and let them

losso o corno o avorio et metilo in la dicta aqua per spatio de 5 hore et molificarasse che porai impromptare quello che tu voli et indurarasse commo prima.

385. *A fare colla de pescio.*—Tolli ossa de Luccio et de omne altro pescio grandicello et sechali poi li spolveriza in lo mortaro de bronzo et poi metti la dicta polve in una pignata nova cum tanta aqua che te paia che sia bastevile ali dicti ossa o polve et falla bollire tanto che sia ben liquefacta poi tocca quella aqua se tene insiemj e bona e de facta poi la leva dal foco et colala cum uno panno de lino et lassa fredare poi ne fa li peze et polla asciugare al vento senza polve.

386. *Ad ingessandum tabulas causa pingendi.*—Accipe tabulas et super eas da ter vel quatuor vicibus cum colla bene calida ab una vice ab altera permite sicari aliquantulum et ultima vice permite sicari valde bene postea habeas gissum pulverizatum et bene macinatum ut sit subtile et distempera cum aqua tepida et da super asidem cum sticca et permite sicari quo facto rade eum gladio scilicet partes grossas deinde habeas gissum subtile cum colla clara bene et non nimis forte et da super gissum positum deties si expediens fuerit cum penello et desicato eum subtilissime rade si vis demum designa cum carbone dulci aut de salce aut de vite et si non consentiret tibi habeas pennam anseris et sepera nigredinem carboni. Et si vis ponere aurum habeas bolarminium subtilissimum et macinatum cum clara ovi fratta et distempera cum aqua pura viz. cum uno ciato aque per unam horam et tempera ipsum bolarminium subtilissimum et da ubi vis ponere aurum nedum bina vice sed multotiens usque octo vice adendo semper bolarminium ut grossus multipliciter et sic habebis intentum balneando cum aqua clara ubi vis ponere aurum bina vice sed posito auro memento stare per unam horam et demum burnias ipsum aurum.

387. *Ad mollificandum ossa.*—Pone ossa in liscivo facto de calce viva et cinera recotta ana et maneant per diem novem

remain for 9 days, and the bones will become as pliant as you wish. And if you wish to colour them, put in any colour you like, and having formed them into shape, anoint them with linseed-oil, and let them dry in horse-dung for 7 days.

388. *To dye skins green.*—Take the sloes which grow upon the blackthorn in the month of September, put them into a kettle, and pound them well; let them boil, and ferment like wine in the sun for 3 days. Then separate the clear liquor from the lees; then take roche alum and a little urine, and twice as much strong white wine vinegar as urine, and dissolve the alum in the vinegar and urine; and when it is cold, alum the skins with the solution; and when they are nearly dry, wash them with that wine made from the sloes, and dry them in the shade. And the more coats you give them, the finer colour will be; and you will thus have a fine colour for dyeing chamois-leather.

389. *To know good galls.*—Good galls are known by their being small and wrinkled, and being hard within and appearing powdery without.

390. *To know good vitriol.*—Good vitriol is known by its being blue within and very granular without.

391.¹ [*To make cheese glue.*]—Take cheese of any sort, tolerably old, and scrape it as thin as paper, or slice it very fine; and then take the scrapings and put them to soak in fresh water for a day. Strain off the water carefully, and then take warm water, as much or rather less than what you threw away, and put the scrapings into the warm water. Knead the whole well with your hands, just as dough is kneaded for bread, in the warm water until all the fat is extracted from the cheese. Continue changing the water, then make the cheese into a cake, and put it into a vase of fresh water, so that it may always be covered with water. And when you wish to use it, take whatever quantity you want of the cake, and mix it with a little quicklime upon a very smooth board, kneading it well with a

¹ The Rubric is wanting.

wooden stick ; then add to it a little sifted gesso, and mix the whole up again for a considerable time, and it will become cheese-glue for cementing wood-work and vases, and it must be used as fresh as possible, because then it takes a better hold.

B 392. *To make a green and red and purple dye for dyeing bones, cloth, thread, and whatever you like, &c.*—Take as much as you like of strong white vinegar, and put it in a glazed vase, and add to it scales of copper and copper-filings of a good red colour, Roman vitriol, roche alum, and a little verdigris ; let everything be well ground and mixed with the vinegar, and let it remain so for 7 or 8 days and nights, and this vinegar becomes a good green tint for dyeing silk, bones, linen cloth, and other things as well as for painting. And if in this liquor you put bones raw or boiled, and boil them and let them remain in the liquor for the space of a month, they will become green for ever. And note that scales of copper make the best tint when fresh beaten. In the same manner things may be dyed red and crimson, using vermilion or minium or verzino, and put whatever you wish to dye into the liquor, and it will dye it well. The same can be done in yellow, using orpiment and proceeding as before directed ; and, if you like, you may put urine instead of vinegar.

poralo bene cum uno pochetino de calcina viva in suso uno asse bene polito et cum uno pastello de ligno li compiglia insiemj poi ce agiongj uno poco de gesso statiato et rimena da capo omne cosa insiemj per gran spatjo e de diventata colla de cascio per incolare lignamj e vasa et operala piu frescha che poi perche fa migliore presa.

B. 392. *Affare tenta verde et rossa et pavonaza a tegnare ossi panni refi et cio che volj etc.*—Recipe aceto bianco fortissimo quanto voi et pollo in uno vaso vitriato et metlice suso bactitura de ramo et limatura de ramo bene colorito rosso vitriolo romano alume de rocho et uno poco de verderamo omne cosa sia bene macinato et mista cum lo aceto et stia cusi per 7. o 8 dj et nocte et questo aceto diventa bona tenta verde per tegnare seta osso panno lineo et altre cose et per depegnare et se in questa cocitura mecterai osso crudo o cotto et faraicilo bolire et de poi stare per uno spatjo de mese diventara verde imperpetuo nota che la bactitura de lo ramo fresca fa migliore tenta.

Et cosi se po fare de lo colore rosso come e dicto de lo verde et pavonazo cum lo cinabrio o minio et verzino et metce a tegnere omne cosa che voi et tignirallo bene et simili se po fare de loropiumento in giallo et fa come de sopra et se voj in loco de lo aceto ce pone orina humana.

De azuris naturalibus et primo de cognoscendo vero lapis
lazuli p. 1.

Cognoscere azurrum alemanum etc. p. 3.

Praxis extraendi azurrum à lapide 3.

Praxis affinandi dictum azurrum 3.

Azurrum ultramarinum alio modo 12.

Dar buon colore all' azuro mal colorito 13, 69.

Azurro d' Alemagna 23.

Cognoscere azurrum ultramarinum ab artificiale 40.

Azurrum artificiale 41 et sequentibus.

Azurro per muro in calcina 54.

Azurro di sugo d' erbe 60.

Azurro per adoprar a penna 62.

Raffinare l' azurro grosso 64.

Moltiplicar lazurro 69.

Far endico 69 et sequenti.

Far verdi diversi 70 e sequenti.

Giallo bellissimo 78.

Lacca bella 90 e sequenti.

Verzino 94 e sequenti.

Pauonazzo con sugo d' erbe 96.

Colore Brasille 96.

Color di grana dal verzino 97.

EXTRACTS FROM A MANUSCRIPT
OF THE
LIBRERIA MARCIANA AT VENICE,
ENTITLED
“SECRETI DIVERSI.”

MARCIANA MANUSCRIPT.

PRELIMINARY OBSERVATIONS.

THE following extracts relative to painting, and the composition of varnishes, were selected from a Manuscript of the sixteenth century, now in the Library of S. Marco at Venice, but which formerly belonged to the Patrician Nani. The Abbate Morelli thus describes¹ the Manuscript:—

“ It is a collection of recipes which make us acquainted with many compositions of the old professors, used in medicine, surgery, farriery, chemistry, painting, illuminating, gilding, working in stucco, varnishing, and similar works. Some of the recipes are common, others but little known. They are written in the Tuscan dialect, and sometimes the names of those by whom they were practised are prefixed. Among these are Andrea di Salerno, Frate Venetiano, Sansovino, Giovanni da Udine, Fundano, &c.”

These various recipes appear to indicate that the MS., like many others, was compiled for the use of a convent by some monk or lay brother, who presided over the infirmary of the convent, compounded the

¹ Catalogo de' Codici Volgari della Libreria Naniana, Venezia, 1776, p. 31.

medicaments, and prepared varnishes and pigments—occupations which, during the middle ages, were frequently carried on by the same person.

The recipes for farriery appear to me sufficient proof that the MS. was not written by an inhabitant of Venice, where they would have been useless, since there were no horses in that city in the sixteenth century.¹

The names of the artists alluded to in the MS. show that the author lived during the beginning and middle of the sixteenth century. It is probable that some at least of the recipes were collected at Rome; for the author remarks, in No. 238, "This I had from Master Andrea di Salerno:" and it does not appear that Andrea ever resided at Florence. Dominici² says that he was for a short period the pupil of Raffaello, whom he left at Rome, in 1513, to return to his own country.

¹ In the fourteenth century, while Venice consisted almost entirely of the Island of Rialto, and that on which stand the Piazza and Church of S. Marco, horses were used there, and it was the custom for the senators to ride on horseback to the Council Chamber; it was even considered beneath their dignity to approach it in any other way. This fact, perhaps, accounts for the number of monuments in the different churches in Venice of men on horseback, which placed, as they generally are, high on the side wall, or over a lofty doorway, present a singular appearance. Shortly after this time the bounds of the city were enlarged by banking up the islands and deepening the canals; and gondolas, which soon became the favourite mode of conveyance, were introduced. The different parts of the city were united by bridges: but as the level of the streets was scarcely above high-water mark, the bridges were necessarily elevated in order to allow the gondolas to pass under them; and as the ascent and descent would have been too steep for foot passengers, the surface was cut into steps, which still remain. These bridges, of course, led to the disuse of horses, which in a short time were no more seen at Venice.

² See Lanzi, vol. ii., pp. 82, 251. Andrea di Salerno was also called Sabbatini. He was born in 1480, and died in 1545.

Unless, therefore, it can be shown that this recipe was written in the kingdom of Naples, we must suppose that it was written a short time previously to 1513. In this recipe it was recommended to mix the blue pigments employed in fresco painting with milk; and as Andrea di Salerno worked with Raffaello, it may be inferred that this was the practice of the best masters of that period.

A recipe invented by Giovanni da Udine, for making Stucco, is given in this MS. Giovanni also worked at Rome under Raffaello, who had been invited by his kinsman, Bramante, to decorate the Stanze of the Vatican for Pope Julius II.¹ This invitation must have been given previous to 1513, for Julius died in that year. In 1527 Rome was sacked, and many artists left the city after this melancholy event, to seek in other parts of Italy a home more congenial to the arts; among these was Giovanni da Udine, who for some time resided at Florence, where he decorated the Palace and the Chapel of S. Lorenzo. Giovanni died in 1561, or 1564.² This recipe was communicated by another artist named in this MS., who, although a sculptor and architect by profession, exercised considerable influence on the sister art of painting. This was Jacopo Tatti, usually called Sansavino or Sansovino,³ a native of Florence, who studied painting under Andrea del Sarto. Sansovino, whose fame extended beyond the bounds of his native city, went also to Rome, on the invitation of Giuliano di S. Gallo, the

¹ Julius II. was made Cardinal in 1471, and Pope in 1503.

² Lanzi, *Indice de' Professori*.

³ Lanzi, vol. iii., p. 152; and *Indice de' Professori*.

architect of Julius II. He continued to reside in this city, returning occasionally to Florence, until the sack of Rome, when he was obliged to take shelter at Venice, where he died in 1570, at the age of 91.

From the above statements it appears that these three artists were at Rome between the years 1503 (the period when Julius II. ascended the Papal throne) and 1527 (when Rome was sacked); and it is highly probable that the recipes were collected during this period. The notices, therefore, of the preparation of the colours and oil, and the various recipes for varnish, will be read with much interest; and may fairly be considered to have been employed at Rome and Florence during the best era of Italian art.

The following facts appear to be established by this MS.:—

1st. That colours for painting in oil were ground with oil only; and, when too stiff for use, they were to be diluted with oil incorporated into the colour by working it in with the pencil.

2nd. That linseed oil was purified by boiling it over the fire with water for three or four hours. It was then suffered to settle and purify.

3rd. That olio-resinous varnishes were considered proper for colours and paintings in oil; but whether they were mixed with the colours, or otherwise, does not clearly appear.

4th. That powdered glass was used as a dryer for lakes and other colours which dried slowly in oil.

5th. That all varnishes were extremely viscous, and were thinned for use as required.

6th. That oil varnishes were common at this period.

7th. That the "vernice comune" sold by the apothecaries or druggists at this period was composed of linseed oil, pece greca, and calcined alum.

The MS. contains some information relative to painting on glass, and we find that there were several methods then in use:—

1st. With certain metallic colours applied on the glass with gum-water, which, by the application of heat in the furnace, penetrated into the glass.

2nd. With transparent colours mixed with oil, which were to be afterwards varnished.

3rd. With coloured glasses or enamels brought from Germany.

4th. With colours tempered with glue, or white of egg.

The first and third methods were probably united, and there is documentary evidence that painting on glass with vitrifiable pigments was known and practised in Italy during the fifteenth century; since in the latter half of this century it was usual to stipulate in contracts for painting windows, that the colours should be burnt in the fire, and not laid on with oil—"cotti al fuoco, e non messi a olio."¹

The method of gilding on glass, described in No. 339, and attributed to a Venetian friar, may have been practised in the glass-works which have been carried on during so long a period at Murano.

¹ See Carteggio Inedito d'Artisti, vol. ii., p. 446—449; and see also the Introduction to this work.

EXTRACTS

FROM

A MANUSCRIPT IN THE MARCIANA LIBRARY
AT VENICE,

ENTITLED

“DIVERS SECRETS.”

214.¹ *Yellow paste like amber.*—Take of gum arabic oz. 3, of varnish in grains² oz. 2, pulverize and mix them well together, place them in a glazed pipkin, and mix them with a drachm of saffron tempered with common water, and let them remain in that state until they become like a paste; then take the yolk of an egg, strain it through an old but good linen cloth, incorporate it with the before-mentioned ingredients, and model with it what you please. Then dry it in the sun until it is hard, and anoint it with white of egg which has been well beaten; dry this also in the sun, and then varnish and gild it according to your pleasure.

301. *Divers colours for painting works in oil, or “a putrido,”* &c.³—And mark that the colours are of two kinds, one of which consists of those which have no body, and which do not conceal the colours laid under them, but only tinge them, as saffron for instance; the other consists of those which have body and which cover every other colour over which they are laid, and many of these colours are inimical to each other, so that by mixing together they spoil each other, as white lead and verdigris and white lead and orpiment.

¹ The numbers in the margin refer to those in the original.

² That is, in grains or tears.

COPIA ESTRATTA

DAL CODICE INTITOLATO

“SECRETI DIVERSI,”

ESISTENTE NELLA BIBLIOTECA MARCIANA.

214. *Pasta gialla come ambra.*—Togli gomma arabica oz : 3. vernice in gran oz : 2. polveriza bene ogni cosa et mescola et poni in una scodella invetriata et mescolavi una dramma di zafferano stemprato con acqua comune, et stieno tanto cosi che diventino come pasta, poi togli uno tuorlo duovo, et colalo per peza lina vecchia ma buona, poi lo incorpora con le predette cose, et improntane quello che vuoi ; poi seccha al sole che sia duro, poi ugni con chiara d' uovo che sia sbattuta ben et seccha al sole, poi vernica et indora a tuo proposito.

301. *Colori diversi per dipingere e lavori a olio o putrido etc.*—Et nota che e colori sono di due sorte una che non hanno corpo e non proprono quello che trovano sotto, ma solamente tinghono, come è verbigratia el zafferano etc. un altra sorte è che hanno corpo e quali quoprono ogni altro colore che essi trouovono sotto, et molti sono inimici l'uno del altro in modo che mescolandogli insieme si guastono, come è biacca e verderame et biacca et orpimento.

³ A putrido—that is, with white of egg which has been suffered to stand until it has become decomposed. See MS. of Jehan Le Begue, No. 298, p. 282.

If, then, you wish to make *white*, take good white lead, and if you wish red, take lake or minium or cinnabar. The lake has no body, therefore take cinnabar, and according as you wish the colour to be more or less dark, take more or less lake. If you wish to make it still lighter add a little white lead, so that it may become lighter coloured, &c.

302. If you wish to make *flesh colour* take white lead and lake, and make it lighter or darker as you please.

If you wish *green*, take verde azurro, and mix it with giallolino and white lead, making it darker or lighter as you please. If you have no verde azurro, take giallolino, or orpiment and azure; mix them together, and you will have a green, adding more or less of one or the other according to the degree of obscurity which you may desire.

303. "*Paglione*" [*pavonazzo*.]—Take white lead and azure and red lake, mix well together, and if you wish the colour to be darker, add more azure; if lighter, add more white lead, and if you wish it redder, put more lake.

304. *Yellow*.—Take pure giallolino, item pure orpiment, item ochre; and because these colours have no body, lay white lead underneath.

305. *Black*.—Take peach stones and char them, or burn ivory, which will make perfect black, &c.

306. *Grey*.—Take white lead, verde terra, ochre, and black; mix together, and put more or less of one or the other until the colour is to your mind.

The colours which have no body are these:—

309. Verdigris, lake, ochre and verde terra, and they are very proper for mixing with those colours which have body.

The tempera of these colours, prepared "a putrido," is water and the yolk of an egg, and the quantity to be used is rather less than half the quantity of colour.

Se adunque vuoi fare bianco pigli biaccha stietta, se rosso togli laccha, o minio, o cinabro. La laccha non ha corpo, pigla adunque el cinabro, et secondo che tu lo vuoi, più o mancho scuro, pigla piu o mancho laccha. Se lo vuoi fare anchora più chiaro mettivi un poco di biaccha secondo che tu vedi che rischiara, etc.

302. Se vuoi fare incarnato piglia biaccha e laccha tanto che lo faccia piu oscuro o piu chiaro come vuoi.

Verde, piglia verde azurro et puossi mescolare con giallolino, et con biaccha, et sarà piu o mancho oscuro secondo che vorrai, et se non hai verde azurro piglia del giallolino, o vero orpimento, et azurro et mescola insieme et farà verde, et mettivi più et mancho dell' uno et del altro secondo che lo vuoi piu o manco oscuro.

303. Paghonazo o piglia biaccha et azzuro et rosso-laccha, et mescola insieme et se vuoi che sia più oscuro, mettivi più azzurro, se piu chiaro più biaccha. Se più rosso più laccha.

304. Giallo piglia Giallolino stietto, item orpimento stietto. Item ocra, et perchè non ha corpo campeggia sotto di biaccha.

305. Nero, piglia noccioli di pesche et fane carboni o vero avorio arso, et fa perfetto nero, etc.

306. Bigio, piglia biaccha, verde terra, ocra, et nero, et mescola insieme et mettivi piu o manco dell' uno o dell' altro secondo che tu vedi, e viene a tuo modo.

Colori che non hanno corpo sono questi :—

309. El verderame, la laccha, l'ocra, el verde terra ; et son buoni a mescolare con quelli che hanno corpo.

La tempera di questi colori fatti a putrido .i. a acqua e el tuorlo del vuovo un pocho manco che la meta del colore etc.

314. *To make "indaco."*—Take flowers of woad and alum water, boil them together, strain through a linen cloth into a vase; then take what remains on the cloth, spread it out on a tile, dry it well, and it will then be fine "indaco."

315. *To make fine azure.*—Take 6 ounces of copper filings, 3 ounces of calcined eggshells, 4 ounces of sal alkali, and 2 ounces of quicklime. Pulverize them well and mix together; then place them in a vase of tinned copper, adding as much of the strongest white vinegar as will cover them, then make the vase air tight, and put it under dung (horse-dung is best) for 20 or 25 days, after which you may take it out, and it will be done.

323. *A most beautiful red from verzino for painting or writing.*—Take lime and make ley, and when you have made it and strained it through a cloth, take any quantity you please, and scrape into it some good verzino, using the quantity which seems best to you, and leave it in that state for 2 or 3 days, until you see that the ley has well extracted the colouring matter of the verzino; then strain it through a cloth, and put on it as much pulverized roche alum as will make the whole of the material feel its virtue,¹ and let it dissolve. Then add to it as much pulverized gum arabic as will give the colour sufficient body, and expose it to the sun for 3 or 4 days, stirring it occasionally that the gum may be dissolved and well incorporated; and when you think it is well purified and of the proper colour, take it from the sun, strain through linen, and keep it for use.

The longer it is exposed to the sun the thicker it will be, &c.; and if you leave it so long as to become hard enough to require distempering when used, you may distemper it with a little of the same ley, and your writing and painting with it will then be very beautiful, &c.

You may add that portion of the verzino which remains on the cloth after the first straining to other verzino, and repeat

¹ That is, a quantity sufficient to coagulate it.

314. *A fare lo Indaco.*—Togli fiore di guado, et acqua alluminata, et fa bollire insieme, et con un panno lino cola sopra un vaso questa cocitura et quello che rimane in sul panno distendilo in su una tegola et fallo asciugare bene, et e indaco fino etc.

315. *A fare azzurro fino.*—Togli limatura di rame oz. 6 scorze di vuova calcinate oz. 3. sale archoli oz. 4. calce viva oz. 2 polveriza ogni cosa et mescola bene insieme et ponile in uno vaso di rame stagnato, et mettivi tanto aceto bianco fortissimo che quopra questa materia, et turalo che non respiri, et mettilo sotto el litame et maxime di cavallo per 20 o 25 giorni, di poi lo cava et sarà fatto.

323. *Colore bellissimo rosso di verzino per dipingere et scrivere.*—Togli calcina et fa liscia et quando l'hai fatta et colata per peza pigliane quella quantità che tu vuoi, et rastiavi su del verzino buono tanto quanto pare a te et lascialo stare così due o 3 di tanto che tu veggha che la liscia habbia cavato la sustantia bene del colore del verzino, poi lo cola per peza, et mettivi su tanto allume di roccha polverizzato che tutta quella materia ne possa sentire destramente della sua virtù, et mestalo che si solva, et mettivi tanta goma arabica polverizzata che gli dia corpo discretamente, et tienlo tre o quattro di al sole, et rimestalo qualche volta accioche la goma si solva et incorporisi per tutto, et quando ti pare che sia bene purgato et fatto di colore a tuo modo, lievalo dal sole et colalo per peza lina, et serbalo et adoperalo.

Quanto più sta al sole tanto più si fa corpulento etc. Et se tu lo lasciassi stare tanto al sole che riventassi si sodo che poi allo adoperare havessi bisogno di stemperare, stemperalo con un poco di quella liscia, et scrivi, et dipingi con esso, et farai una cosa bella etc.

Quella materia del verzino che rimane della prima colatura, vi puoi aggiugnere verzino eodem modo et rifarne e o simile al

the process in the same manner, either adding the same kind of wood as at first, or using a more common sort, according to the quantity which you may add, &c.

325. *Divers colours for colouring window-glasses and other works.*—If you wish to make a beautiful black which will penetrate into the glass, take fine iron filings, especially those of needles, if you can procure them good, or otherwise those scales which fall from the iron when it is beaten while red hot on the anvil; then take an equal quantity of burnt lead or tin, or perhaps rather more of the lead than of the iron, which you will learn by experience, and grind them well together, with water on the porphyry like any other colour. Then distemper the mixture with gum water made with soft water, and draw your subject on the glass with this, letting it dry in the shade; place it in the furnace of a potter (who will generally know how to regulate the heat), and heat it according to the best of your knowledge in an iron vase, otherwise cover it with ashes only, and it will be beautiful.

Burnt lead or tin is prepared in the following manner:—Put as much as you wish of it into a vase over the fire and liquefy it; and from time to time, while it is still over the fire, take off the scum, and continue to do this until no more arises. In order to refine it, put the whole into an empty vase; and while it is over the fire, stir it so that the whole of the contents may be well calcined, and then keep it for use.

If you wish to make a beautiful yellow colour¹ which may penetrate into the glass, grind some silver leaf with a little honey and water, that it may hold together; then wash it in

¹ Silver, “either in the metallic or any other form, possesses the singular property of imparting a transparent stain, when exposed to a low, red heat, in contact with glass. Modern glass painters are accustomed to obtain three colours from silver, yellow, orange, and red. For this purpose no flux is used, the prepared silver is merely ground up with ochre or clay, and applied in a thick layer upon the glass. When removed from the furnace the silver is found not at all adhering to the glass; it is easily scraped off, leaving a transparent stain, which penetrates to a certain depth. If a large proportion of ochre has been employed, the stain is yellow; if a small

primo, o del più dozzinale secondo la quantità che ve ne aggiungi etc.

325. *Colori diversi per colorire vetri da finestre et da altri lavori.*—Se lo vuoi fare nero bello et penetra nel vetro togli limatura fine di ferro, et maxime limatura d' agoro quanto se ne potessi havere, è buona, o di quella scaglia del ferro che cascha quando si batte caldo in su l' anchudine, et togli piombo o stagno arso, d' ognuno parte eguale et più presto un poco piu piombo che scaglia come per experientia vedraj, et macina bene con l' acqua in sul porfido, et fanne a uso di colore, poi lo tempera con acqua di ghoma che sia dolce, et dipingi quello che vuoi in sul vetro et lascia secchare a l' ombra, poi gli metti in fornace di questi che fanno stoviglie, e quali gli sanno comunemente quocere et quocigli ut scis in vaso ferreo assuoli con la cenere et verrà bello.

El piombo o lo stagno arso si fa cosi. Metti quella quantità che tu vuoi in uno vaso al fuoco e squaglialo, et stia cosi al fuoco, et quella stiuma che egli fa di mano in mano cavala, et tanto fa cosi che si consumi in questa, poi per raffinarla mettila tutta insieme in quel vaso dove non sia altro, et stando sopra el fuoco, rimescolala in modo che si arda tutta bene, poi serbala al bisogno.

Se vuoi fare colore giallo et bello el quale etiam penetra nel vetro. Macina ariento in foglio con un poco di mele acciocchè si tenga insieme et con l'acqua, poi lavallo con le ditta nella

proportion, it is orange-coloured; and by repeated exposure to the fire, without any additional colouring matter, the orange may be converted into red. This conversion of orange into red is, I believe, a matter of much nicety, in which experience only can ensure success. Till within a few years this was the only bright red in use among modern glass painters; and though the best specimens certainly produce a fine effect, yet it will seldom bear comparison with the red employed in such profusion by the old artists." Extract from an Essay on the Art of Glass-painting in the Philosophical Magazine for December, 1836.

water with the fingers until it is well purified, in the same manner as powdered gold is treated. Distemper this silver with gum water made with soft water, dry it, then heat it in a furnace as before, and it will become very beautiful, &c.

If you wish to paint with other colours which, although beautiful, do not penetrate into the glass, but remain on the surface, especially with verdigris, fine lake, peach-stone black, or charcoal black, and generally all the colours which have no body, and also with fine azure, that is, ceneri azzurri, give a coat of nut oil or linseed oil, which last is to be preferred for painting on glass, according to the painting which you wish to execute, and let it dry in the shade; then grind up the colour with the same oil, and paint upon the coat of oil and let it dry, and it will be beautiful; and although the colour does not penetrate, it will for a long time remain beautiful, and you may even varnish it afterwards, according to the best of your skill.

And with these colours, and with coloured glasses brought from Germany, and with ornamental works done with gold "ut scis," on glass, you will make beautiful windows and other works.

And when you paint with the verdigris, if you grind some saffron in the same manner with the before-mentioned oil, and with this distemper the verdigris, it will be a green so much the more beautiful, &c.

You may also paint with these colours on window glasses and on drinking glasses, and on other utensils made of glass; and you may also fasten on the glass leaf gold and silver; and on this you may paint with colours or smalti, whichever you please; and in the same manner you may lay divers colours over each other, and you will thus execute most beautiful works on glass or crystal, on vases, windows, and bell-glasses, and on plates of glass which are to be afterwards joined together, and a thousand different kinds of painting according to your taste, &c.

328. *If you wish to paint on glass "a putrido."*—First lay

acqua tante volte che sia bene purghato come si fa al' oro macinato : poi tempera questo ariento con acqua di ghoma che sia dolce et lascia secchare ; poi quoci in fornace ut supra et verra molto bello etc.

Se vuoi colorire d' altri colori e quali saranno begli ma non penetrano nel vetro, ma stanno in superficie : et maxime verderame, laccha fine, nero di noccioli di pesca arsi, o di carbone et universalmente tutti e colori che non hanno corpo et azurro fine .l. di cenere, etc. Da col pennello una mano di olio di noce, o di lino è meglio in sul vetro secondo la dipintura che vuoi fare, poi lascialo bene secare a l' ombra, poi macina el colore con detto olio, et dipingi sopra quello, et lascia secchare ; et sarà bello, et benchè non penetri durera assai tempo bello, puoi etiam poi invernicalo ut scis.

Et con questi colori et con vetri coloriti, che vengono della magna, et con lavori fatti d' oro ut scis in sul vetro farai bellissime finestre et lavori.

Et quando tu dipingi col verderame, macina del zafferano al medesimo modo con detto olio et con questo tempera el colore del verderame et sara tanto piu bello verde etc.

Puoi etiam in su vetri da finestre et bicchieri, et altri lavori di vetro fare lavori di questi colori et puoi etiam appicchare in sul vetro l' oro et l' argento di pezi, et in su quello lavorare di colori et di smalti quello che vuoi etiam di diversi colori l' uno sopra l' altro, et in questo modo farai lavori bellissimi sopra vetro o cristallo, sopra vasi, finestre, et campane, et piastre di vetro da congiungerle poi insieme, et fare mille lavori secondo la tua fantasia.

328. *Se vuoi dipigniere in sul vetro a putrido.* – Da prima

on a coat of soft and hot glue, and when this is dry paint on it.

You may temper the colours with yolk of egg, and also with weak and slightly warm glue, the blue and white especially, for these two colours are much more beautiful and bright when distempered with glue than with yolk of egg.

When you paint with blue in fresco, that is, on walls, and you desire that it may retain its colour and not turn black, as generally happens to the blues, distemper the colour with the milk of goats or of any other animal. This I had from Master Andrea de Salerno.

329. *The mode of making the best black printing ink.*—Make a large lantern, two feet and a half broad on each side, and ten or twelve feet in height, and cover it with cotton paper or parchment, for one is as good as the other, and let there be a door at the foot of it, and put into it a tripod, and on the tripod a pan, and on the pan two pounds of Greek pitch. Set the pitch on fire, then shut the door; take care that the lantern is air-tight, and let the pitch burn until it is entirely consumed, when the smoke from it will affix itself to the interior of the lantern like soot; then take out the earthen pan and the tripod, shut the door, and with a rod beat the outside of the lantern, when the black will fall to the bottom, leave it to settle there; then take it out and preserve it for use. But if you wish to clean the lantern more perfectly, tie some hen's feathers to a rod, and sweep the inside of the lantern with these, and add the black which you thus sweep off to the other black. When you desire to make printing ink, take the varnish which is used for varnishing, and the more perfect its quality the better. But in default of other, you may use that common sort which is sold by the apothecaries¹ for varnishing wood and similar things, and procure a wooden rod, such as is used in making carpenters' glue, with which the varnish is to be stirred; and put some of the black into it, and liquefy it as you require it; and with this you know books are printed, &c.

¹ See the recipe for "Vernice comune," No. 405.

una mano di colla dolce et calda et quando è seccha dipingivi sù.

Et puoi temperare i colori col tuorlo dello vuovo, et etiam con la colla dolce et un poco calda, et maxime lo azurro et el bianco per questi due colori vengono più begli et piu chiari a temperargli con la colla che con l' uovo.

Et quando tu dipingi con l' azurro, in fresco cioè in sul muro et tu voglia che mantenga il colore et non riventi nero come comunemente fanno gli azurri, temperalo col latte o sia di capra o d' altro non importa. Hoc habui a Magistro Andrea de Salerno.

329. *Modo di fare el nero da stampare e libri optimo.*—Fa un lanternone largo per ogni verso un braccio et quarto et alto cinque o sei braccia, et incartalo di carta bombagina o pecora non importa; et da pie fa che habbia uno sportello et mettivi un tre pie et in sul tre pie un tegame; et nel tegame due libre di pece greca et metti fuoco nella pece, et serro lo sportello, et fa che el lanternone non sfiati da alcuna parte, et lascia ardere, tutto el fumo che riesce s' appicha per il lanternone, a uso di filiggine; alhora cava el tegame et el tre pie, et sera lo sportello, poi batti di fuora el lanternone con una bacchetta, et quella materia chascherà in fondo, lasciala riposare, poi la cava et serbala et se tu vuoi meglio nettare il lanternone, in sur una bacchetta legate penne di gallina et spazalo dentro per tutto, et questo serba col primo, et quando voi fare la compositione per istampare, toglì vernice fatta da invernicare, quanto migliore è tanto è meglio: ma basta di quella comune che vendono gli spetiali per invernicar legname et ogni cosa: et habbia un menatoio di legno di quegli da fare colla da legnaiuoli, et rimena di questa vernice et mettivi di questa materia, et falla liquida a tuo proposito, et con questa si stampa i libri come tu sai, etc.

339. *Mordant for gilding glass, which has been tried by a Venetian friar.*—Take one ounce of mastic which has been roasted, not burnt, but dried carefully, one ounce of coperosa¹ which must be fine and white and not grey, one ounce of varnish in grains, and half an ounce of burnt roche alum. Pulverize the ingredients finely, and grind them up with well purified linseed oil. When you use this mordant, grind it with linseed oil well purified, and when you use it distemper it with the same oil, so that it may be of the consistence of ink, lay it on the glass, and expose it to the sun when it does not shine very strongly, and if the sun is very hot, place it in the shade, but in such a place that the sun may be reflected on it, and let it dry so far that when touched with the finger a slight impression may be left on it. When this is the case, lay on the gold and let it dry well; then clean it with the cotton, varnish the gold, and let it become perfectly dry.

But do not wash vases gilded in this manner except with fresh water, and be very careful in rubbing them.

Linseed oil is thus purified:—Boil it over the fire with water for 3 or 4 hours, then let it settle and separate it from the water.

² *Tried by the painter Fundano.*³—A most excellent mordant for laying gold on oil paintings, on walls, on wood, on leather, on silk, and on cloth, and on everything you please, first laying on glue (and fish glue is best) wherever you may wish to lay on gold; and the glue must be applied thinly on cloth and similar things in order that the cloth and silk may not absorb it. The glue being laid on and dried, the mordant is applied, and then immediately the gold, leaving it to dry, and not burnishing it. So where there is no glue lay on the mordant, and immediately after apply the gold.

346. *On marble and stones.*—Take linseed oil boiled in the usual way, and take giallolino and verdigris and tow (?) in equal parts; grind these things dry, then mix them with

¹ Sulphate of Zinc.

² From p. 167 of MS.

339. *Mordente per porre oro in vetro ex fratre vinitiano provato.*—Togli mastice abbruciato, ma non sia arso, ma diseccato discretamente once una, et coperosa che sia bella et bianca et non bigia oncie una. Vernice in grani oncie una. Allume di rocha arso oncie mezza. Polverizza ogni cosa sottilmente, et macina con olio di lino bene purificato: et quando lo adoperi stemperalo etiam cum questo olio che vengo come inchiostro cioe corrente; et pollo in sul vetro, et poi pollo a sole che non sia molto caldo; et se el sole fussi caldo assai pollo a sechare a l'ombra dove el caldo del sole reverbera, et secchisi tanto che resti in modo che toccandolo col dito pizichi un poco et all'ora poni loro et lascia seccare poi spaza e campi con la bombagnia quando è secco bene. Et poi davi su la vernice in su loro et falla bene seccare.

Ma non lavare questi vasi dorati in questa maniera, se non con acqua fresca et stropicciali discretamente.

L'olio di lino si purifica cosi: fallo bolire al fuoco tre o quattro hore con l'acqua, poi lascialo riposare poi separalo dall'acqua.

Ex pinctore fundano provato.—Mordente ottimo a porre oro in muro sopra dipinture a olio in su legno in cuajo et seta in tela, ma dando prima la colla et in su ogni altra cosa che vuoi, dando la colla dove bisognassi darla: et di pescie è meglio, et in su tela o simili cose da la un poco tenaretta accioche la tela o seta non la bea, et data la colla et seccha si pone el mordente et subito l'oro et lascia seccare et non brunire, similmente dove non si pone la colla, poni el mordente et subito l'oro.

346. *In sul marmo et pietre.*—Togli olio di seme di lino seconda la quantita che ne vuoi fare, cotto ut scis et togli giallo-lino, verderame, et stoppino in parte eguale, macina queste

³ Lanzi mentions seven painters of the name of Fontana, most of whom flourished in the sixteenth century.

oil, and lay the first coat on the marble or stone, and let it dry. This is done on account of the fragility of the marble, in order that it may not spoil the other things which are laid on it, &c.

Then lay on a coat of liquid and hot glue, and proceed as above directed.

Although these coats must be very dry they should not remain long exposed to the sun, but for a short time only, especially in winter, and then rather to prevent their being cold than for the purpose of drying them in the sun.

¹ And observe, as an universal rule, that all oil mordants resist the water, and that those in which no oil is used do not withstand the water, &c.

Also when you wish to lay the mordant on polished iron or marble, or any other polished surface, you must first lay on a coat of glue neither too thin nor too thick, and let this dry; then lay on the mordant, and then the gold, because without the glue, the mordant would not adhere firmly.

351. *Item. A most excellent mordant of garlic juice for gilding all things, pasteboard, panels, walls, iron, marble, tin, gesso, and leather, even if they are rough.*—Take gum ammoniac, reduce it to powder by pounding it on a stone with garlic juice, and while grinding it, add a little gum arabic in such quantity that all the substances which you are grinding may have a slight proportion of it, because if you were to put too much it would dry too quick. Then grind up so much bole as will colour the whole substance, and grind up all these things together one after the other with garlic juice strained through linen, and if during the grinding these ingredients should become too viscous on account of the garlic juice and consequently difficult to grind, add some vinegar, but not more than is necessary. It is then finished, and you may use it immediately, distempering it with vinegar so that it may be sufficiently liquid and may flow well on the pencil. If you wish to preserve it ready made, it will keep for some

¹ From p. 171 of MS.

cose asciutte et mescola con l'olio, et da il primo letto in sul marmo o pietra, et lascia seccare, et questo si fa per la fragilità del marmo acciò che la non guasti l'altre cose che vi si pongano su etc.

Poi da una mano di colla liquida et calda poi fa tutto come è detto di sopra.

Queste cose anchora che bisogni sieno bene secche non vogliono molto stare al sole se non un poco, et maxime di verno, più per conforto del freddo che per seccare col sole.

Et nota che universalmente, tutti e mordenti a olio reggono a l'acqua il che non fanno gli altri che non sono fatti con l'olio etc.

Item quando vuoi dare il mordente in sul ferro pulito, o marmo o altra simile cosa liscia: da prima una mano di colla, non troppo liquida ne troppo tenace, et lasciala seccare, poi da el mordente, poi poni l'oro: perchè senza quella colla non si appicherebbe bene el mordente.

351. *Item. Mordente di sugho d'aglo ottimo per porre oro in su ogni cosa, cartoni, tavola, muro, ferro, marmo, stagno, gesso, sopra corame etiam che fusse crespo.*—Togli armoniaco et pestalo in polvere prima, poi lo macina in su la pietra con sugho d'aglo poi vi metti macinando un poco di gomma arabica, tanta che tutta quella materia macinata ne senta per tutto modestamente, perchè la troppa sarebbe troppo di secchativa, poi simul etiam macina tanto bolio che dia colore a tutta questa materia, tutte queste cose macina insieme l'una dopo l'altra con sugo d'aglo colato per peza, et se nel macinare queste cose le fossino troppo viscoso per amore del sugo, et non le potessi così bene macinare, mettivi dello aceto quanto puoi forse tanto che basti a fare bene macinare et è fatto: Et lo puoi adoperare al' hora se tu vuoi, et stemperalo con l'aceto tanto che sia liquido che corra bene col pennello a tuo proposito. Et se tu lo vuoi serbare fatto dura assai tempo et quando ne vuoi adoperare sendo sodo stempera con aceto ut dictum est.

time, and when you wish to use it, distemper with vinegar as previously directed.

353. *Item. A mordant of garlic juice.*—Pound the garlic, and pass the juice through a linen cloth, then grind up this juice with a little white lead to give it proper body, adding Armenian bole in quantity sufficient to colour it entirely, and as much urine as is sufficient to enable you to grind and incorporate it well, to make it sufficiently liquid to be applied well with the pencil. Then lay it on your work, let it dry, moisten it by breathing on it, lay on the gold and fix it with cotton; then let it dry. You may preserve this mordant for some time after it is made, and when you wish to use it, if you find it hard distemper it with urine, then gild and burnish the work. And I think, according to the experience that I have had of the simple garlic juice, that it is good for laying gold on almost everything, even on marble, and it is not affected by the dampness of the marble, or by the dampness of its situation unless it is exposed to the rain, and in this case every mordant of garlic is affected.

And if you wish to gild on silver with amalgam in some places only, and not all over, lay garlic juice with the pencil over those parts to which you intend the gold shall not adhere, and let it dry. Then lay on the gold with the amalgam all over, just as any other thing is gilded with amalgam, and the gold will not adhere to those parts on which garlic has been applied, and you will thus have the gold alone on clean grounds. You may then remove the garlic juice from the work and clean it well, and in this manner you may execute beautiful works.

Take also any work executed in tin after your own design, and clean it well; then cut, or pound, or bruise a clove of clean garlic, and anoint well with it the tin over the design on which you wish to lay the leaf gold; then gild and fix the gold with the cotton, and let it dry; afterwards burnish it dexterously, and, lastly, uncover the ground of tin which you did not intend to gild. On these you may paint or enamel, or varnish, and execute most beautiful works.

353. *Item. Mordente di sugo d'aglio.*—Pesta l'aglio et passalo per peza, poi macina di questo sugo con un poco di biacca tanto che gli dia corpo a discretion, et poi tanto bolio armenio che tinga quella qualità che tu macini, et tanta orina che basti a farla bene macinata, et incorporata, et liquida a tuo proposito per darlo col pennello, et pollo in sullavoro et lascialo seccare, poi lo rinviene con l' alito caldo, et poni l' oro, et fermalo con la sua bambagia, et lascialo seccare ; poi spaza e campi ut scis. Questo mordente, dura assai tempo fatto, et quando ne vuoi adoperare et fussi duro, stemperalo con l' orina, pruova a brunire. Et credo secondo la esperientia che ho del sugo d' aglio semplice che sia buono a porre olio quasi in su ogni materia ; et etiam in sul marmo, et non rinviene propter humiditatem marmoris nec loci humidi, nisi desuper pluat, il che fa etiam ogni mordente d' aglio.

Et se vuoi dorare sopra argento com malgama et vuoi che resti dorato in alcun luogo et non per tutto, dove tu vuoi che l' oro non si appichi ; da col pennello sugo d' aglio, et lascialo seccare ; poi da l' oro con la malgama per tutto come si dora ognaltra cosa con malgama, et dove sarà il sugo dello aglio, non si attacherà, et cosi harai l' oro solo in su campi netti, poi puoi levare el sugo del aglio et nettare bene, et farai lavori begli et netti.

Togli etiam el lavoro di stagno fatto a tuo modo et nettalo bene, poi habbia uno spicchio d' aglio mondo, et taglialo o soppestalo, o masticalo et poi ugni con esso sottile lo stagno sopra el disegno dove tu vuoi porre l' oro di pezzi et ponvi loro et fermalo bene con la bambagia poi lo lascia seccare, poi lo brunisci destramente, et poi scoprire poi e campi dello stagno dove tu non vuoi che sia loro, puoi etiam sopra loro dipignere smaltare invernicare, et farai lavori bellissimi.

You may also draw what you please on the tin, and gild the remainder of the ground ; thus the works will be tin, and the ground gold.

You may also try the experiment on parchment or cotton paper, first polishing it, and then anointing it with the cut clove of garlic, having previously bruised or pounded the garlic, if necessary, gilding it as above and burnish it if you please.

370. *Colours tempered with oil are prepared in the following manner.*—Grind up the colour with linseed or nut oil as stiff as you can, that is, with as little oil as possible, and so that it may be very fine, and that on being felt between the fingers, no hard grains can be perceived ; and when you paint with it, if you find the colour too stiff, dip the pencil in a little oil and incorporate it well with the colour.

377. *A most excellent glue for damp and moist places which always becomes harder, but only fears the heat, and fixes everything to wood and stone, which must be as smooth as porphyry.*—Take one pound of good yellow wax, nine ounces of liquid varnish, and one pound of black naval pitch. Put the varnish into a pipkin over a slow fire, that is hot enough to liquefy without burning it ;¹ then throw in the wax, liquefy it in the same manner and incorporate it well with the varnish ; then do the same with the pitch, having previously pounded it, etc. Then take Armenian bole ground to a fine powder, and stir some of it into the other ingredients until the whole material becomes liquid, and yet so tenacious that it fixes and holds together firmly the things which you wish to glue together ; and you must stir the ingredients well together and use them warm, because in a short time the cement hardens so that you cannot glue with it. And when you have applied it where you please, and wish to make the surface smooth and polished, take a firebrand from the fire and bring it near to the glue until the heat causes it to liquefy and spread ; you should also move about the firebrand

¹ A proof that varnish was extremely viscous, if not absolutely solid.

Et puoi etiam disegnare lo stagno secondo che tu vuoi et poi el resto de campi mettere a oro et cosi e lavori saranno bianchi, et el campo doro.

Puoi prouare anchora ad ugnere la carta pecora et bambagina, prima lisciata et poi ugnarla sottilmente con lo spicchio del aglio tagliato, et se bisogna masticato o sottoposto et porre l' oro ut supra et vedere se esibrunisse.

370. *E colori temperati a olio si fanno in questo modo.*—Macina el colore con olio di lino, o di noce et macinalo duro quanto puoi, .l. con poco olio, quanto puoi, et macinalo tanto che sia bene sottile che tu lo senta col ditto senza nocciolino o rendina alcuna : similmente quando tu dipigni e ti fussi troppo sodo toca un poco d' olio col pennello et incorpora bene col colore.

377. *Colla ottima per luoghi humidi et molli che sempre più indurisce, ma solo teme el caldo et appicha ogni cosa insino a legno con pietra et che la pietra sia liscia come porfido.*—Togli cera gialla buona libbra una. Vernice liquida oz. nove. Pece nera navale lib. una. Metti la vernice in uno pignattino, et poni al fuoco lento che si scaldi bene, et si squagli et non arda, poi mettivi lacera et squagliala similmente et incorpora colla vernice ben, poi fa similmente della pece la quale prima sia pesta bene etc. poi habbia boljo armenio pesto bene in polvere et mettivene su tanto che tutta questa materia resti tanto liquida che possa essere tenace in modo che si possa bene appicchare, et tamen pigli et tenga forte a cose le quali vuoi incollare insieme, et incorpora bene ogni cosa insieme, et subito cosi calda incolla quello che vuoi, perchè aspetta poco et indurisce poi in modo, che non potresti incollare. Et quando tu l' hai posto dove tu vuoi, et tu lo voglia fare liscia et pulita di sopra, togli un tizone di fuoco et accostalo alla colla tanto che senta el fuoco et si distenda per se medesima, et va menando il tizone per tutto et falla distendere, et assottigliare a tuo modo, et verra

over the surface of the glue, and melt it so that it at length becomes smooth and beautiful, &c. And on putting the work which you have cemented into water, it will immediately become very hard.

394. *Modes of making divers varnishes ; and first, of "ben-givi" (Benzoin), which will dry in the shade.*—Take 2 oz. of spirit of wine which has been distilled 4 times (that which has been distilled 3 times will do, but not so well), and one ounce of benzoin. Put the ingredients into a bottle, and shake them until the benzoin is dissolved ; the varnish is then finished. It must be kept in a vessel closely stopped. This is a very fine varnish upon miniatures and all other delicate works, on paste, or glue, or wood, and also on paper and glass.

395. *Item, a varnish.*—Take one pound of linseed oil, boiled "ut scis,"¹ etc., and anoint the vessel with it while hot, and 4 ounces of pounded carabe ;² place it to dissolve with the bottle closed on the coals, and when it is nearly dissolved pour in the hot oil and stop it up ; afterwards, at the proper time, when the whole is dissolved, stir in 3 oz. of alum.

Dilute the varnish with the necessary quantity of naphtha, or linseed oil, or spirit of wine, and use it warm.

396. *Item, a varnish of benzoin, which dries very quickly and may be used on everything, because it is pale and admirable for all delicate works.*—Put into a large glass vessel 5 ounces of good spirit of wine, with an ounce of fine benzoin pounded into very small pieces ; stop the vessel closely, and agitate it until the benzoin is well dissolved. Then let it stand for a day and a night ; pour off the clear part, throw away the sediment at the bottom, and keep the liquid in a well-closed glass vessel : this liquid is the varnish.

397. *Item, an excellent varnish which is made without the aid*

¹ Ut scis, &c. See ante, No. 339, p. 620.

² The word is written "Carbone" in the MS. in the Marciana, and "carabone" in recipes somewhat similar in the Nuovo Plico and Abecedario. I have ventured to translate it "carabe" (amber), because it is quite

liscia et bella etc. Et mettendo il lavoro incollato nell' acqua fresca si farà subito durissima.

394. *Modi di fare vernice di Verse et prima di bengivi che secha etiam al' ombra.*—Togli acqua vite stillata quattro volte, tre volte fa, ma non si perfettamente oz due bengivi oz una diguaza in ampolla usque ad solutione belzui ut scis, et è fatta : serbala turata : questa è cosa finissima, quasi sopra miniature, et ogni altro lavoro fine di pasta, o colle o legname et cartoni, et vetro.

395. *Item vernice.*—Togli olio di lino libre una cotto ut scis etc. ugni la boccia cum illo calido : carbone oz quattro, pesta et poni a solvere con la boccia turata in su carboni, et quando è quasi soluta inmitte olium calidum et tura ; de inde tempore suo quantum est solutum, inmitte tres uncias alluminis.

Stempera con olio di sasso .l. petronio o di lino o acqua vite q̄n oꝑz caldar. ut scis etc.

396. *Item Vernice di bengivi che secha prestissimo et puossi dare in ogni luogo perchè è chiara et mirabile in su ogni lavoro finissimo.*—Metti in una ampolla grossa di vetro oz cinque d' acqua vite buona, et una oz di belzui buono pesto in pezzuoli minuti, et metti tutta detta acqua et tutto il bengivi et tura l' ampolla bene et diguazala tanto che el bengivi si solva bene : poi lascialo posare un giorno, et una notte poi cavala per declinatione et buta via el fondaccio che resta, et serva questa acqua bene turata nella ampolla et questa è la vernice.

397. *Item vernice ottima la quale si fa senza fuoco, et secha*

clear that carbone does not liquefy over the fire, and because, after a diligent search, I can attach no other meaning to it. I consider this to be the common recipe for amber varnish : the amber being dissolved in a vessel previously greased to prevent it from burning, before the hot oil is added.

of fire, which dries very quickly without being exposed to the sun, and remains very clear, and with which may be varnished anything painted on panel, pasteboard, or iron.—Take spirit of wine which has been rectified at least three times, because otherwise it would not dissolve the benzoin properly, and put it in a glass vessel; then take some benzoin and add either at once, or a little at a time, that quantity which you know to be sufficient. Then stop up the bottle and agitate it until the benzoin is entirely dissolved; and if, after it is dissolved, it is of the consistence of good “*vernice liquida*,” and, as it were, tenacious, and varnishes well, it is finished; but if it is too thick, add more spirit of wine until you bring it to the correct standard; and if it is too thin, add more benzoin. You may then preserve it for use.

398. *Item, a varnish tried by Master Jacopo de Monte San Savino, the Sculptor, which is proper for every kind of work and on all materials.*—Take one ounce of sandarac, ground to a very fine powder, and 3 ounces of clear nut oil. Heat the oil in a glazed pipkin over a slow fire in the same manner as linseed oil is boiled; then add the powdered sandarac a little at a time until it is dissolved; add to it also at the same time so much clear incense finely powdered as will impart a pleasant savour to the whole mixture, stirring it well that it may dissolve, and, if you please, you may also add a sufficient quantity of burnt and pounded roche alum to have a sensible effect on the whole composition; and the addition of the alum will improve the varnish if you stir it until it is dissolved. It should then be strained through a linen cloth, and afterwards exposed to the sun and dew until a sediment is formed, which should be separated by pouring off the clear varnish, after which it will be ready for use.

399. *Item, a varnish which spreads like oil, dries quickly, and is very lustrous and beautiful, appearing like a glass mirror, and which is admirable for adhering firmly and for varnishing lutes and similar things.*—Take one pound of linseed oil, boil it in the proper manner in a clean glazed pipkin, add to it half

senza sole prestissimo, et resta molto chiara, et si può vernicare ogni lavoro dipinto in tavola o in cartoni o sul ferro.—Togli acqua vite che sia passata tre volte almanco perchè non solverebbe bene altrimenti et mettila in una ampolla di vetro, et togli del bengivi et mettivene dentro quella quantita, tutta a un tratto, o a poco a poco che sia abbastanza ut intelliges: et tura l' ampolla, et diguaza tanto che el bengivi si solva tutto bene, et se quando è soluto ti resta come vernice liquida buona, e che sia in modo tenace che invernichi bene, a l' hora è fatta. Sin autem, se fussi troppo dura aggiungivi tanta acqua vite che torni ala misura, et se fussi troppa liquida aggiugnivi tanto bengivi che torni al proposito, et serbala et adoperala.

398. *Item vernice ex Mag^o. Jacobo de Monte S. Savino scultore provata. Et serve a ogni lavoro et in ogni materia.*—Togli una oz di vernice in grani macinata sottilissima et tre oncie di olio di noce chiaro; quoci l'olio lento igne in pignattino invetriato, come si cuoce l' olio di lino: poi mettivi su la vernice a poco a poco, mestando anche quousque solvatur: poi mettivi su al medesimo modo tanto incenso chiaro polverizzato sottile, che condisca discretamente tutta la materia et mescola tanto che si solva bene, et se vuoi poi mettivi tanto allume di roccha arso et pesto che condisca questa materia virtute sua: tanto sarà miglore, et mesta quousque solvatur. Poi colala per peza lina poi tienla al sole, et al sereno poi colala per declinatione, et serbala et adoperala etc.

399. *Item Vernice che si distende come olio et seccha presto et è molto lustrante et bella et pare uno specchio di vetro et per stare a la cosa et sopra liuti et simile cose è mirabile.*—Togli per una misura: una libra d' olio di linseme, et quocilo come si fa in una pignatta invetriata netta, poi vi metti su meza

a pound of well pulverized clear and fine Greek pitch, and stir and incorporate the whole over a slow fire; then add half a pound of powdered mastic, and the moment you have done so, withdraw the pipkin gradually from the fire, because it swells up, and incorporate the ingredients thoroughly; then replace the pipkin on the fire, and keep it there until everything is well dissolved and mixed, when some burnt and pounded roche alum of the size of a nut should be added and mixed, until that also is entirely dissolved and incorporated. Then take the varnish off the fire and strain it through an old linen cloth. Your varnish is then made, and it will be found to be beautiful varnish for wood, iron, paper, leather, and all kinds of painting and works, and for withstanding water. When you find it too viscous, dilute it with linseed oil in the proper manner.

400. *Item, a most excellent varnish of mastic for lutes, leather, panels, cloths, wood, and pasteboard.*—Take 3 ounces of strained and clear linseed oil, and boil it. Then take half an ounce of mastic pounded and ground, and add it gradually to the oil, mixing it in such a manner that it may be entirely dissolved and incorporated with the oil, and that it be properly evaporated and made into a varnish “ut scis;” then put in a little pulverized roche alum at discretion, but sufficient to affect all the varnish; keep it over the fire until it is entirely dissolved and incorporated with the varnish and evaporated, after which you may take it off the fire, and strain it through an old and good linen cloth, when it will be finished. But observe that everything should be done over a charcoal fire and with great care.

401. *Item. A most excellent mastic varnish.*—Take one pound of mastic, half a pound of naphtha, and half an ounce of clear nut oil; melt them together in a bottle or glass over a charcoal fire, and strain through an old linen cloth.

402. *Item. A most excellent clear and drying varnish proper for colours, both in oil-painting and other kinds of painting.*—Take 2 ounces of clear and good nut oil, one ounce of clear and good Greek pitch, and half an ounce of clear and good mastic;

libbra di pece grecha chiara et bella et polverizzata et mesta quando la metti, tanto che si incorpori bene a fuoco dolce, poi vi metti su mezza libra di mastice macinato, et quando lo metti perchè ei rigonfia leverai però la pignata da fuoco et mettilo su a poco a poco mestando et incorporandolo bene, poi torna la pignata al fuoco et mesta tanto che si solva ogni cosa bene, poi mettivi quanto una noce di allume di roccha arso pesto et mesta che si solva et incorpori bene poi lievala dal fuoco et colala per peza lina vecchia et serbala, et per legname, et per ferro et per carta et corame et per ogni dipintura et lavoro farà un opera bellissima et per stare alla aqua, et quando ti pare soda stempera con olio di lino come si fa etc.

400. *Item Vernice di Mastice optima per Liuti, quoio, dipinture di Tavola et di tela, per lavori di legname et cartoni.*—Togli tre oz d'olio di lino colato et chiaro, et quocilo, poi abbia un oz $\frac{1}{2}$ di mastice pesto et macinato, et mettilo in sul' olio a poco a poco mestando in modo che si solva et incorpori bene con l'olio et che sia sfumato ben et fatta vernice, ut scis; poi mettivi un poco di allume di roccha arso et pesto, et sia a discretionem secondo che tutta la quantità della vernice ne partecipi: et sta al fuoco tanto che si risolva et incorpori la virtù sua colla vernice et svapori, ritiralò poi dal fuoco, et colala con peza lina vecchia et buona, et è fatta. fa ogni cosa con fuoco di carboni et discreto.

401. *Item. Vernice di mastice optima.*—Togli mastice libre una, olio petronio libre meza, olio di noce chiaro oz meza fondi insieme in boccia o in bicchiere sopra carboni. cola con peza lina vecchia et è fatta.

402. *Item. Vernice ottima chiara et dissecativa ben per colori et a olio et per ogni dipintura.*—Togli per una misura: due oz. d'olio di noce chiaro et bello, et una oz. di pece greca chiara et bella, et meza oncia di mastice chiaro et bello, macina la pece

grind the pitch and the mastic [separately] to a very fine powder, and place the oil in a clean glazed pipkin over a charcoal fire, and let it boil gently until it is done sufficiently, that is, until one-third has evaporated; then put in the powdered pitch a little at a time, mixing and incorporating it well; afterwards throw in the mastic in the same manner, and when it is dissolved, take the varnish off the fire and strain it through a fine and old linen cloth.

And if you wish it to be still clearer, prepare the mastic with tepid water in the following manner:—Take the largest and clearest tears of mastic that you can find, and soak them in tepid water, so that they may become tender; then select the best pieces, dry them, and pound them.

You may also try the effect of adding a little burnt and pulverized roche alum when the other ingredients are dissolved, so that the whole may virtually be seasoned with it, straining it afterwards. This is done in order to purify it better.

403. *Item.* A varnish of “*olio di abezzo*,” which dries both in the sun and in the shade.—Take “*olio di abezzo*,” which must be genuine and not adulterated, and if you wish to know whether it is falsified, distemper it with nut or linseed oil, or naphtha, heating both the oils, &c., and spread it on a work, when, if it is not genuine, it will not dry for a long time, and then badly, because it is adulterated with turpentine, but if it is genuine it will dry quickly and perfectly.

If you desire to varnish delicate works which will not be exposed to water, but merely to bring out the colours and show their beauty, distemper the *olio di abezzo* as above. But if you wish to varnish more permanently on works which are intended to resist water, do not distemper the *olio di abezzo* with other ingredients, but heat it in a vase, melt it, and varnish with it.

When you distemper it with linseed or nut oil, let it be with oil which has been exposed to the sun to evaporate, and the varnish will be much clearer.

et il mastico sottile, et poni a fuoco di carboni in uno pignattino netto et invetriato l' olio et fallo bollire dolcemente tanto che sia bene cotto .|. tanto che scemi el terzo : poi vi metti su la pece macinata a poco a poco mestando ed incorporando, poi vi metti el mastice simili modo, et quando è bene soluto, ritirala et colala con peza lina sottile et vecchia.

Et se tu vuoi che la sia ancora più chiara ; acconcia el mastice con l' acqua tiepida in questo modo. Togli i grani del mastice piu grossi et chiari che puoi et metti in acqua tiepida tanto che intenerisca. Cavane el midollo et secchalo, poi lo macina.

Puoi etiam provare quando ogni cosa e soluta a mettervi un poco di allume di roccha arso pulverizzato tanto che condisca virtualiter tutta quella materia poi la cola. Questo si fa per farla più purgata.

403. *Item. Vernice d' olio di beza che seccha al sole, et senza sole.*—Togli olio di bezza che sia schietto et non falsato et se vuoi conoscere se è falsato stemprane un poco con olio di noce, o di lino, o di sasso caldi tutti due etc., et distendine in sur un lavoro, e non seccherà se non con gran tempo et male, perchè lo falsano anche con la trementina, ma se e schietto seccha presto et bene.

Se tu vuoi invernichare lavori gentili che non habbino a stare a l' acqua, ma per colori et bellezza stemperalo ut supra. Ma se tu vuoi invernicare più fermamente in lavori che reghino alla acqua non lo stemperare con altro, ma scaldalo in un vaso et struggilo et invernica.

Quando tu lo stemperi con l' olio di lino o di noce, togli che siano stati al sole a svaporare et sera più chiara assai.

404. *A most excellent varnish for varnishing arquebuses, crossbows, and iron armour.*—Take of linseed oil, lbs. 2 ; varnish in grains (sandarac), lb. 1 ; clear Greek pitch, oz. 2.

Boil the oil, then dissolve in it the other ingredients, and strain through a much worn linen cloth, and when you wish to use the varnish, scrape and polish the work, and heat it in a hot oven, because that is the best place to heat it ; and when it is of a proper heat, that is, when the varnish adheres to it firmly and does not fry [bubble or blister from too great heat], then lay it on thinly with an instrument of wood, so that you may not burn your fingers, and it will make a beautiful changing colour.

And if you supplied the place of Greek pitch with naval pitch, I think it would make the work black when you varnished it.

When making the varnish you must boil it well, even to such a degree as to make it foam and bubble, if necessary, in order that it may be clear and thick.

405. *Item. An excellent common varnish, good for varnishing whatever you please.*—Take 2 ounces of clear and good linseed oil, and one ounce of good and clear Greek pitch, but 2 ounces of the latter also will make the varnish thicker and give it more body ; boil the oil over a slow fire, and then put in the pounded pitch a little at a time, that it may incorporate well, and add a little roche alum previously burnt and pounded, and when it is incorporated and boiled sufficiently, that is, when you try a little of it in your fingers and find that it is done, strain it and keep it. When it is used it will be beautiful and good ; if it is too tenacious you will dilute it with a little oil.

And if you wish it commoner so as to sell it at a larger profit, take 10 ounces of oil to one of pitch ; and if you use black pitch it will be good for pommels of swords, spurs, and similar things.

406. *Item. Varnish [pounce] for writing paper.*—Take the shells of unboiled eggs, soften them in water for a fortnight, then take off the pellicles and wash them ; dry them well by exposing them to the heat of the sun or the fire, then pound and grind

404. *Vernice ottima per invernichare archibusi et balestre et armadure di ferro.*—Togli olio di seme di lino libre 2. vernice in grani libre 1. pece grecha chiara oz 2.

Quoci l' olio, poi struggivi dentro l' altre cose, poi cola con peza lina usata, et quando vuoi invernicare el lavoro, limala o nettala prima bene, poi lo scalda in un forno caldo perche fa meglio che scaldarlo altrove, et quando è debitamente caldo, cioè caldo in modo che la vernice vi si appiccha su bene et non frigge alhora invernicha et dalla sottile, con uno istromento di legno, acciò non ti quocha le dita, et farà un bello colore cangiante.

E se tu vi mettesti in luogo di pece grecha pece navale, credo farebbe il lavoro nero quando tu lo invernicassi.

Quando la fai falla bollire assai, et stiumala si oportet acciocchè la sia bene chiara et spessa.

405. *Item. Vernice ottima comune et buona da invernichare quello che vuoi.*—Togli olio di lino chiaro et buono, oz. 2. Pece Grecha chiara et bella, oz. una ma se ne toi due verrà più tenace et corpulenta : quoci l' olio lento igne, poi vi metti la pece pesta a poco a poco tanto che incorpori bene, poi mettivi un poco di allume di roccha arso et pesto, et quando è incorporato et cotta a sufficientia : e quando ne pruovi un poco fra le dita et sentila fatta : colala et serbala, et usala, et sera bella et buona, et quanhai adoperarla fassi un poco tenace temperala con olio.

Et se la vuoi più dozinale per vendere con più guadagno togli x oncie d' olio et una di pece. Et se la togli nera sara buona per pomi di spade et sproni, et similia.

406. *Item. Vernice da porre in su le carte da scrivere.*—Togli guscia d' uova non cotte, tienle in molle nella acqua per 15 di, poi lieva bene le pillicule et lavale bene, poi le asciuga bene al sole, o al caldo del fuoco, poi pestale et macinale, et

them and sift them through very fine rags. Then add to a pound of these $\frac{1}{2}$ an ounce of clear incense, also strained through rag and grind them up together; then pass them again through rag. This is found to succeed well.

393. *Tried by Master Jacopo di Monte S. Savino, the sculptor. Admirable stucco for making and modelling figures, and for colouring them, and it resists water.*¹—Take of finely powdered travertine lb. v., and if you would have it finer and more delicate, take fine marble instead of travertine, and 2 lbs. of slaked lime; mix them together with water, and stir and beat them well together like a fine paste, and execute what works you please with it, either by forming it with your hands or in moulds, and dry it in the shade. And if you wish to colour it white, when the work is dry enough to be tolerably firm, but not quite dry, grind white lead with water in the same way as colours are ground, and flower [or finest particles] of sifted lime, and apply it with the pencil, and it will be very white, and will effectually resist water. And if you wish to colour it with other colours, let the work dry perfectly, and then colour it; but these colours will not resist water, like the white, because they do not incorporate or unite so well as that does with the materials of which the work is composed. If, then, you wish the colours to resist water, apply on the work the above-mentioned composition (which is to be used in the manner described), and paint on it with oil-colours.

You may also colour the stucco with colours ground up dry, but these will not be so bright as if they were applied afterwards.

¹ The invention of this stucco is ascribed to Giovanni da Udine, on the following authorities:—Morelli,² in his description of the Marciana MS., observes, . . . “M. Jacopo da Monte, whose method of making varnish and stucco is there shown; the stucco is the same as that which, on the authority of Raffaello Borghini (Riposo, p. 402) and of others, was invented by Giovanni da Udine, and by him employed in the celebrated Loggie of the Vatican.”

Borghini's

² Catalogo de' Codici della Libreria Nani, p. 32.

passale per istraccie che sieno finissime, poi mescola una libra di questa con $\frac{1}{2}$ oz d' incenso chiaro, passato come questa et macinale insieme, et passa iterum per straccio et è buona, et provata, et riesce bene.

393. *Ex Magistro Jacopo de Monte S. Savino Scultore—prouato. Stuccho mirabile per fare figure &c. et etiam improntare et colorirlo, et regge allacqua.*—Togli treuertino macinato sottile v libra, et se uuoi che sia più gentile et delicato, Togli marmo fino in luogo di treuertino, et togli dua lib. di calcina spenta et mescolale insieme con acqua et rimenale et battile bene insieme come pasta fine et fanne che lauoro tu uuoi, o con mano o impromptato con le forme, et secchalo alombra et se lo uolessi colorire di bianco, quando il lauoro è tanto seccho che sia fermo, ma non secco interamente, macina la biaccha con l' acqua auso di colore, et fiore di calcina colata, et dalla col pennello, et sara bianchissimo, et stara forte allacqua, et se lo uuoi colorire d' altro colore, lascia secchare il lauoro perfettamente; poi lo colorisci, ma questi colori non reggeranno à lacqua come quello bianco, perche non si incorporano, ne si vniscono con la materia del lauoro come fa quello. Se a dunque tu uuoi che questi colori reghino à lacqua da insul lauoro la inzuppatura disopra detta la quale si da come qui dice, et poi dipigni à olio.

Puoi etiam colorire lo stuccho co' colori macinati asciuttj: ma non uenghono tanto vivi, quanto a colorirgli poi.

Borghini's account of the invention of this stucco is as follows: "While Giovanni was working with Raffaello at Rome, excavations were made in search of antiquities among the ruins of the palace of Titus, and some apartments were discovered decorated with grotesque paintings and small historical figures and ornaments in relief, composed of stucco. Giovanni and Raffaello went together to see them, and were lost in admiration. Pictures of this kind being found in grottoes, were called 'Grotesques.' They were carefully copied by Giovanni, who made many imitations of them in various places, and nothing was wanting but to discover the mode of making the ancient stucco; he, therefore, tried so many things, that at last he discovered that he could make the ancient stucco with lime made from white

travertine, mixed with white marble in the finest powder; and so, these stucchi, with beautiful grotesque ornaments, and many new and rare designs, were employed by the order of Pope Leo (X.) in the Loggie of the Vatican."

Vasari, in his Life of Giovanni da Udine, mentions these experiments at greater length, and informs us what materials he tried before he succeeded in imitating the ancient stucco.

MANUSCRIPT

PRESERVED IN THE

LIBRARY OF THE UNIVERSITY
OF PADUA,

ENTITLED

“RICETTE PER FAR OGNI SORTE DI COLORE,”

ETC.

PADUAN MANUSCRIPT.

PRELIMINARY OBSERVATIONS.

THIS Manuscript, without the date or name of the author, is certainly Venetian. It is in quarto, is written on paper, and is numbered 992.

The handwriting is of the seventeenth century; and although, from the following circumstance, the MS. may have been written during the latter part of the sixteenth century, I think it more probable that it was composed during the middle, or latter part, of the seventeenth century.

In the fly-leaf preceding the commencement, and in the same hand-writing, and in similar coloured ink, is a sonnet (dedicated to Prince Emanuel Philibert, of Savoy), which appears to have been composed by the Canonico Michael Angelo Blanchiardi di Torino, as his name is affixed to it.¹

Now, Emanuel Philibert died in 1580; if, therefore, Dr. Blanchiardi composed the MS., he must have done so previous to this period, and the MS. might have been written soon after the sonnet.

¹ The work on colours is followed by a copy, in a more recent hand-writing, and with blacker ink, of a letter from "Il principe D. Anton. Ottoboni al Sig. P. Pietro suo Figlio hora Cardinale eletto dal Ste Papa Alessandro Ottavo suo Zio. 1698."

Some parts of the early sections of the work, from No. 1 to No. 13 inclusive, bear such strong resemblance to parts of the 3rd book of Lomazzo's Treatise on Painting, that it can scarcely be supposed that one was not copied from the other. Lomazzo's work was published in 1584; if, therefore, parts of the MS. were taken from this, the date must be later than that period.

But independently of these considerations, the work bears intrinsic evidence of having been composed at a later period. A change seems to have taken place during the interval that elapsed between the composition of the MS. of the Marciana and the Paduan MS., not only in the pigments used, but in the varnishes. Essential oil varnishes are introduced in great abundance; Spirit of Turpentine, Oil of Spike, and Naphtha, are the diluents; while the hard varnishes, made with amber and sandarac, have nearly given place to mastic and olio di abezzo.

Among the varnishes for pictures is one (No. 94) described as "Alla Fiaminga," which is composed of spirit of wine, sandarac, and olio di abezzo. "Oglio cotto," prepared by boiling nut or linseed oil with litharge, is twice mentioned, namely in No. 70 and No. 96.

One recipe only is given for making Lac Lake, but Gum Lac is frequently mentioned, being applied to the novel purpose of composing varnishes, by which the Indian Japan work was to be imitated. The MS. contains recipes for varnishes of this description composed of different ingredients; and for the preparation of the colours used in Japanning.

Yamboge was used at this period as a pigment, and



was prepared for painting by grinding it with lemon-juice and roche alum. I do not know when this substance was first used as a pigment, but it was first employed for medical purposes about 1603.

Articles of American produce are mentioned as in use; among these are Campeachy wood (or Logwood) and Cochineal lake, which seems almost to have superseded the lac lake as a pigment. Cochineal is said to have been introduced in the beginning of the sixteenth century.¹ It seems at this time to have been usually prepared with lemon-juice, or crystallized arsenic.

In order that the Lakes, and some other colours, should dry when mixed with oil, glass, very finely pulverized, was mixed with them; and it is added, that they would then dry in twenty-four hours.

We also find that paintings in oil had begun to suffer from the effects of age; and that they required, or it was believed that they required, to be washed with some corrosive liquid, and to be re-varnished. Directions, or rather recipes, for both these processes are given.

No. 83 contains some recipes in Latin (the only part of the MS. written in that language), which seem to have been considered secrets.

A method of transferring prints on to a plate of glass is described (in No. 95), in which it appears that the design was fixed by means of heat. It was probably painted afterwards, for in No. 96 a recipe for painting and gilding on glass is given, in which the colours are to be ground with boiled oil. The fact of this method being described in two Italian MSS., and the stipulation

¹ It was introduced into Spain soon after 1523.

respecting it in contracts, proves the extent to which it was used in Italy.

Two different recipes for etching grounds, and aquafortis, are mentioned in this MS.

In conclusion I shall observe, that in addition to the subjects I have mentioned, the MS. contains the usual recipes for colours used in miniature painting.



PADUAN MANUSCRIPT;

ENTITLED

'RICETTE PER FAR OGNI SORTE DI COLORI," ETC.

RECIPES FOR ALL KINDS OF COLOURS.

1. *Of Colours in general, and of what materials they are composed, &c.*¹

White is made with gesso, lime, white lead, powdered marble, egg-shells well pulverized and sifted, and with the bone of the cuttle fish ground to a very fine powder.

Yellow is made with "gialdolino di fornace" of Flanders and Germany,² orpiment, and ochre, with saffron and gamboge for water-colour painting.

Blue is prepared with ultramarine and Hungarian³ blues. Others are made with "snalti" and "smaltini"⁴ of every kind, especially with those of Flanders, which are the best, with "biadetti"⁵ and similar pigments.

Green is made with the "verde azzurri,"⁶ verdigris, "verdetto,"⁷ which is called "gialdo santo," and approaches to yellow,

¹ The whole of this chapter so closely resembles the fourth chapter of the third book of Lomazzo's Treatise on Painting (although additional colours are named in each class of painting), that it is scarcely possible to suppose that the author of the MS. had not seen that work; unless, indeed, it could be proved that both writers had made use of some common original work, which had been used as a text book by the Lombard painters, in the same manner as the old Byzantine MSS., so variously rendered into Latin, in the Paris copy of Eraclius, the Clavicula, the Sloane MS., and the Theophilus of the British Museum.

² In Haydocke's translation of Lomazzo, written in 1590, the names of these two colours are translated "Masticot" and "generall."

RICETTE PER FAR OGNI SORTE DI COLORI.

De' Colori in generale, e di qualli materie si componghino.

Il Bianco si fa col gesso, calcina, biacca, marmo pesto, gusci d' ouo bene polverizati, et settazzati, e con osso di sepia benissimo macinato.

Gialdo si fa col gialdolino di fornace di Fiandra, et Ale magna, orpimento et ocrea, col zaffarano et Gomma gute, quali sono per l' acquarello.

Turchino si prepara con gl' azuri oltramariini et ongari et altri si fa ancora con gli smalti, e smaltini d' ogni sorte, massime con quelli di Fiandra, che sono li migliori, con li Biadetti et simili.

Verde si fa con li verde azurri, verderami, verdetto, che si chiama gialdo santo, e tira al giallo, terra verde, verde porro,

² Hungarian Blue. Native blue carbonate of copper.

⁴ Smalti and Smaltini. The smalti of Flanders were probably preparations of Zaffre; the smaltino was most likely the blue glass, "Azzurro di Pozzuoli," described by Orsini and Galliani in the notes to Vitruvius.

⁵ Biadetti. The artificial carbonate of copper.

⁶ Verde azurri. Armenian stone, also a native carbonate of copper, in which the blue colour is mixed with the green. Haydocke translates this "Green bize."

⁷ Verdetto is defined by Borghini (Riposo, p. 169) to be a native green pigment brought from the mines of Germany. Giallo Santo is usually considered to be a yellow lake made from the flowers of the plant called "Barba di Becco," the yellow goat's beard; also from the Reseda Luteola (weld

“terra verde,” “verde porro,”⁸ and for water-colours, “verde di vesicha” or “pasta verde” [sap-green], the juice of rue, and of blue lilies.

Mulberry colour is made with “morello di ferro” and “morello di sale,” burnt Roman vitriol, “celeste,” and dark indico ; and for water-colours, Turnsol.

Red is made with cinnabar, terra rossa, and fine lake.

Orange is made with minium and burnt orpiment.

Black is made with the smoke of burnt nut oil, burnt almond shells, smoke of burnt rosin, and black earth.

The shadows of the flesh are made with terra d’ ombra, terra verde burnt, and asphaltum.

2. *The composition and mixtures of the colours, and first of white lead.*⁹

Sbiadato is made with white lead mixed with ochre, and is a colour similar to straw, or white lead with terra gialla.

Biondo is made with white, ochre, and gialdolino.

Celeste is made with white lead, and blue or smalti, and indico.

Pale green is made with a mixture of white lead and verdigris.

Bright green is made with white lead, verderame, or giallo santo, or the juice of rue.

Yellow is made with white lead and giallo santo.

Agatino is made of white lead and morel di ferro.

Blue is made with white lead and blues, or indico together.

The colour of unripe strawberries is made with white lead and cinnabar, but with more cinnabar than white lead.

Berettino and smoke colour are made with white lead and black well mixed together.

or dyer's weed) and other yellow flowers. From a comparison of this chapter with Haydocke's translation of Lomazzo, it appears that the colour here called Verdetto was one of those lakes to which the name of "Pink" has been given. The colour in question, perhaps, resembled "Brown Pink."

e poi l' acquarella, verde di vesicha, o sia pasta verde, succo di ruta, di gigli azurri.

Morello si fa con morello di ferro, e di sale, vitriolo romano cotto, celestro, et indico oscuro, e per acquarella il tornasole.

Rosso si fa col cinaprio, terra rossa, lacca fina.

Ranzetto si fa col minio et oropimento arso.

Negro si fa col fumo d' oglio di noce arso, guscio di Mandola arso, fumo di ragia, et terra negra.

Umbra delle carni si fa con terra d' ombra terra verde arsa, e spalato.

Compositione e mischia di colore e po. della biaca.

Sbiadato si fa con biaca mischiata con l' ocrea, et è color simile alla paglia, o biaca con terra gialla.

Biondo si fa con biaca, ocrea, e gialdolino.

Celeste si fa con biaca, e azuro, o smalti, et indico.

Verde smorto si fa con biaca e verderame mischiati.

Verde vivo si fa con biaca, verderame, o giallo santo, ovvero suco di ruta.

Gialdo si fa con biaca e giallo santo.

Agatino si fa con biaca e morel di ferro.

Turchino si fa con biaca e azurri, ovvero indico insieme.

Color di fragole mal mature si fa con biaca e cinaprio ma più cinaprio che biaca.

Berettino e color di fumo si fa con biaca e negro ben mischiati insieme.

* Verde Porro. Perhaps the same as the Prasinum or Prasino of the old writers. Baldinucci (Voc. Dis.) says that it is a pigment of a whitish green colour, like that of the leek, whence it takes its name.

° Compare this passage as far as No. 13 with Lomazzo's Treatise, lib. iii., cap. vii.

Rose colour is made with white lead and cinnabar, but more cinnabar than white lead.

The colour of stone, wood, bark of trees, and hair, is made with white lead and umber.

Straw colour is made with white lead and gialdolino.

3. *Mixtures of Gialdolino.*

Green colour for the distance in landscapes is made with gialdolino, blue, smalti, smaltino, and white lead.

Green is made with gialdolino and indico together.

A brighter green is made with gialdolino, indico, and orpiment.

The colour of flames and glories is made with gialdolino and cinnabar.

Orange colour is made with gialdolino and cinnabar, but with more cinnabar than gialdolino.

4. *The mixtures of blues, smalto, and "biadetti."*

Dark green is made with blue and giallo santo.

For purple and dark morello, blue and lake are mixed together.

A morello a little lowered in tone is made with blue, lake, and umber.

A morello of a very low tone is made with azzurro, lake, and black.

5. *The mixtures of verdigris.*

For bright green, verdigris is mixed with giallo santo.

Bright green for water-colour painting is made with verdigris, rue-juice, and saffron.

Dark green is made with verdigris, indico, and umber, and it is lowered by adding black.

6. *The mixtures of Indico.*

Dark purple is made with indico and lake.

Color di rose si fa con biaca e cinaprio, ma più cinaprio che biaca.

Color di sassi, legni, scorze d' alberi e capelli si fa con biaca e terra d' ombra.

Color di paglia si fa con biaca e gialdolino.

Mischio del Gialdolino.

Color verde per lontani paesi si fa col gialdolino, e azzurro, smalto o smaltino, e biaca.

Verde si fa col gialdolino et indico insieme.

Verde più vivo si fa col gialdolino, indico, et orpimento.

Color di fiamme e splendori si fa col gialdolino e cinaprio.

Color di Naranzo si fa con gialdolino e cinaprio, ma più cinaprio che gialdolino.

Mischie degli azurri smalti e biadetti.

Verde oscuro si fa con azzurro e giallo santo.

Pavonazzo e Morello scuro, si mischia azzurro con biaca.

Morello che perde un poco si fa con azzurro, lacca, e terra d' ombra.

Morello che perde assai si fa con azzurro, lacca, e negro.

Mischie del verderame.

Verde vivo si mischia il verderame col giallo santo.

Verde vivo per l' acquarella si fa col verderame, succo di ruta e zafferano.

Verde perso si fa con verderame, indico, e terra d' ombra, e si perde assai più aggiungendovi il negro.

Mischie dell' Indico.

Pavonazzo oscuro si fa col indico e lacca.

The colour of iron, silver, tin, &c., is imitated with indico, lake, and black.

7. *The mixtures of cinnabar.*

The colour of ripe strawberries is imitated with cinnabar and lake.

Scarlet is made with cinnabar, lake, and white lead.

Blood colour is made with cinnabar and lake.

The red colour on the cheeks of beautiful flesh is represented with cinnabar, lake, and white lead.

The colour of burnt ochre is imitated with cinnabar and black.

8. *The mixtures of lake.*

The colour of cinnabar is imitated with lake and minium.

The shades of the flesh are made with lake, minium, and umber.

The colour of black velvet is made with lake, blue, or indico and black.

The colour of velvet of a berettino colour [grey] is imitated with lake, cinnabar, ochre, and white.

Flesh colour is made with lake, cinnabar, ochre, and white.

Violet colour is made with lake and blue.

Dark morello colour is made with lake and blue or indico.

9. *The mixtures of minium.*

Orange colour is made with minium alone.

A light orange colour is made with minium and gialdolino.

10. *The mixtures of Gialdo santo.*

The colour of green grass or verdure is represented with gialdo santo and verdigris.

Emerald colour is imitated with gialdo santo, rue-juice, and verdigris, for miniature painting.

11. *The mixtures of black.*

Light berettino is made with black, white, terra d' ombra, lake, and indico.

Color di ferro, Argento, stagno, et simili, si fa con indico lacca e negro.

Mischie del cinaprio.

Color di fragole mature si fa con cinaprio e lacca.

Color di scarlato si fa con cinaprio lacca e biacca.

Color di sangue si fa col cinaprio e lacca.

Color di guancie colorite di bella carne si fa con cinaprio, lacca, e biacca.

Color d' ocrea arsa si compone col cinaprio e negro.

Mischie della lacca.

Color di cinaprio si fa con lacca e minio.

Ombra di carne si fa con lacca, minio, e terra d' ombra.

Color di veluto negro si fa con lacca, azurro overo indico, e negro.

Color di veluto berettino si fa con lacca, azurro o indico, negro, e bianco.

Color di carne si fa con lacca, cinaprio, ocrea e bianco.

Color di viole si fa con lacca e azurro.

Morello oscuro si fa con lacca, e azurro overo indico.

Mischie del minio.

Color di naranzo si fa col solo minio.

Color ranzato chiaro si fa col minio e gialdolino.

Mischie del giallo santo.

Color di verde pianure si fa col giallo santo e verderame.

Color di smeraldo si fa col giallo santo, succo di ruta, e verderame per miniare.

Mischie del negro.

Berettino chiaro si fa col negro, bianco, terra d' ombra lacca et Indico.

Smoke colour is made with black and white.

12. *The mixtures of white.*

The colour of the tops of mountains is made with white, ochre, and maiolica,¹ and they will appear as if touched by the sun.

Flame colour is made with white, gialdolino, and cinnabar.

13. *Of the shades in general, and how each of the above-mentioned colours should be shaded.*²

We must first warn you that the shades must not be laid on lighter or darker than the colour which is to be shaded can bear. All the mixtures of compound colours must be shaded with the darkest of the colours of which they are composed, used pure, and in the following manner :—

Celeste made with blue and white, must be shaded with pure blue.

Green made with white and giallo santo, is shaded with giallo santo.

Light morello mixed with umber, must be shaded with dark morello.

Blue made with indico and white lead, is shaded with pure indico.

Cinnabar mixed with white, is shaded with cinnabar alone.

Umber mixed with white, is shaded with umber alone.

Blue, black, smaltino, and biadetto, are shaded with indico, lake, and black.

Verdigris is shaded with indico or black.

Pure giallo santo is shaded with umber.

Dark morello is shaded with black.

White is shaded with black or berettino.

Gialdolino is shaded with ochre, or terra gialla, and umber.

¹ Majolica, a red earth. (Terra Rossa.)

Color di fumo si compone col negro e bianco.

Mischie del bianco.

Color delle cime de' Monti si fa con bianco, ocrea, maiolica, e pareranno toche dal sole.

Color di fiamma si fa col bianco, gialdolino, e cinaprio.

Dell' ombre in generale, e come si debba ombreggiare ciascheduno de suddetti colori.

Avertasi prima a non dar ombra più oscura, ne più chiara di quello che può comportare quel colore che si deve ombreggiare. Tutte le mischie fate di più colori si devono ombrare in quel colore pure, che nella mischia resta più oscuro, e nel modo che segue.

Celeste, fatto con azurro e bianco, l'ombra con puro azurro.

Verde fatto di bianco e giallo santo, l'ombra col giallo santo solo.

Morello chiaro cioè mischiato d'ombra con morello scuro.

Turchino fatto d'indico e biaca, o bianco, s'ombra con indico puro.

Cinaprio mischiato con bianco, s'ombra con cinaprio solo.

Terra d'ombra mischia con bianco, s'ombreggia con terra d'ombra sola.

Azurro, negro, e smaltino, e biadetto, s'ombrano con indico, lacca, e negro.

Verderame, s'ombra con indico e negro.

Gialdo santo puro, s'ombra con terra d'ombra.

Morello oscuro, s'ombra col negro.

Bianco, s'ombra col negro o berettino.

Gialdolino, s'ombra con ocrea o terra gialla, e terra d'ombra.

* See Lomazzo, lib. iii. cap. viii.

Saffron for water colours is shaded with the same saffron, mixed with a little lake and umber.

Orpiment is shaded with terra gialda and a little umber.

Cinnabar is shaded with lake, or a mixture of cinnabar and black.

Dark yellow is shaded with a mixture of lake and black.

Umber is shaded with black.

A red made with lake, and white, and other mixtures, is shaded with lake alone.

Cinnabar is shaded with lake.

All light colours, except white, are shaded with umber.

14. *How gum water for dissolving and distemping the colours for miniature painting is made.*—Take what you consider to be a proper quantity of very clear and clean gum arabic, leave it infused in rose water for a night with a little candied sugar, in a clean glass vase, which you will then place in a pipkin or other vessel, with common water in it; let the water in the pipkin boil for a short time, and the gum water will then be perfectly prepared, so that the colours will not crack or scale off.

15. *To make a good green from blue lilies.*—The flowers must be pounded with lemon juice, a little burnt roche alum, and glassmaker's soda, and then strained through a fine linen cloth, put in shells, and dried in the shade.

16. *To make a good green of verderame.*—Take 10 parts of verdigris, 2 of corrosive sublimate, $\frac{1}{2}$ a part of saffron, $\frac{1}{4}$ of galls of Istria, and $\frac{1}{2}$ of sal ammoniac, grind them up with very strong vinegar (distilled vinegar is the best), put them into a glass vase, and when the vinegar is clear and coloured, let it be decanted and evaporated in a glazed vase. Then pour fresh vinegar on the remainder, mix again and do as before, until the part which settles ceases to colour the vinegar, and if you pour the coloured vinegar into shallow open vases, it will dry much quicker either in the sun or in the shade. When dry remove

Zaffrano per l' acquarella, s' ombra con l' istesso zaffrano meschiato con poco di lacca, e terra d' ombra.

Orpimento s' ombra con terra gialda, e puoca terra d' ombra.

Cinaprio s' ombra con lacca, ovvero cinaprio e negro meschi.

Gialdo scuro s' ombra con negro e lacca meschi.

Terra d' ombra s' ombreggia col negro.

Rosso fatto di lacca, e bianco, et altri mischie, s' ombra con lacca sola.

Rosso di cinaprio, s' ombra con lacca.

I colori chiari, eccetto che il bianco, si ombreggiano con terra d' ombra.

Come si facci l' acqua di gõna per disciogliere e temperar i colori per miniare.—Piglierai quella quantità di gomma arrabica ben chiara e netta che ti pare, la porai in infusione per una notte in acqua rosa con un poco di zucchero candito in un vaso di vetro ben netto, quale indi metterai in una scudella, o altro vaso in acqua cõmune dentro, che poi facendo bollire per poco tempo l' acqua della scudella che haverà dentro il uasetto con l' acqua gõmata, che così restarà cotta a perfettione, e non creparanno li colori, meno si spicaranno.

Per cavar un bel verde da gilij azurri.—Si pestano li fiori con succo di limone, puoco alume di rocca bruggiato, e soda di vetriari, e colato per pezza sottile, si mettono in conchilie, e si lasciano asciugare all' ombra.

Per fare un bel verde di verderame.—Verderame, ¹⁹ solimato, ² zafrano, ¹ galla d' Istria, ¹ e sal amoniaco. ¹ Si macina il tutto con aceto fortiss^{mo}, e se fosse distilato sarà meglio, poi si metta in vaso di vetro, e quando il d^{to} aceto sarà chiaro e colorito si decanti, e si mēta in vaso vitriato ad asciugare; e sopra le residenza si metta novo aceto, si mescoli sempre, e si facci come sopra sin à tanto che le residenze non rendino più colorito l' aceto, et quelli acetti coloriti mettendoli in vasi spanti si sciugaranno più presto all' ombra, et anco al sole, et seccati gen-

the colour gently by dipping the pencil in vinegar, and afterwards grind up the colour with a little roche alum and a little gum arabic, so as to make it into a cake.

17. *To make another brilliant green.*—Take oz. vi of the best verdigris, oz. ij of tartar of Bologna, and dr. j ss. of roche alum; pulverize the whole, and grind each article separately, then grind them together rather stiffly with distilled vinegar, put the powder into a glass vase with a little saffron, and expose it to the sun. Then pour on it a bocale of distilled vinegar, and the longer it is exposed to the sun the more beautiful will be the colour.

18. *How to make yellow.*—Take flowers of wall-flowers, grind them up with roche alum, strain through rag, and preserve the juice.

19. *How gamboge is refined.*—It is ground up with lemon juice and burnt roche alum.

20. *How cinnabar is refined.*—It is boiled with vinegar and roche alum.

21. *How to prepare lake for miniature painting.*—Steep the pounded lake in rose water for 12 hours to soften, then grind it up with gum water made in the before-mentioned manner, adding lemon juice, vinegar, burnt alum, and candied sugar at discretion. Observe, that burnt lake makes a beautiful shadow colour.

22. *How to prepare cochineal.*—Boil it with lemon juice, garlic juice, and burnt alum.

23. *How paper of "rosseto di Spagna" is used.*—Apply first a coat of lemon juice, then one of alum water, and lastly another of lemon juice, letting each coat dry before the next is laid on. Afterwards, dipping the pencil in lemon juice, take the rosseto off the paper as you require it.

24. *How ultramarine blue is distempered.*—It is softened in boiled water for a night, and is then taken out and tempered with clear glue.

25. *How to purify the turnsole.*—Boil it with urine, then strain and squeeze it through a cloth.

26. *How to grind gold and silver for writing and miniature*

talmente col pennello bagnato d' aceto li anderai leccando, e raccogliendo il colore, qual poi con poco d' alume di rocca lo remacinerai, et puoco di gomma arrabica acciò si faccia in pietra.

Per fare un altro verde lustro.—Piglia verderame 3 vi del più bello, tartaro di Bologna 3 ij, alume di rocca 3 jss, si polverizi il tutto e si macini separatamente, poi messi insieme con aceto stilato, macinato alquanto duretto, mettasi in vaso di vetro al sole con poco di zafrano, e vi si aggiunga sopra un bocale d' aceto stilato, e più che starà al sole sarà più bello.

Gialo come si facci.—Si pigliano fiori di uiolette gialle, si macinano con alume di rocca, e colato per pezza il succo si conserva.

La gomma gute come si raffini.—Si macinerà con succo di limone et alume di rocca bruciato.

Il cinaprio come si raffini.—Facciasi bollire con aceto et alume di rocca.

La lacca come si prepari per miniare.—Mettasi in mole la lacca pesta, in acqua rosa per 12 hore, poi si macini con l' acqua di gomma d^{ta} di sopra, giongendoui succo di limone, aceto, alume bruciato, e zuccaro candito il tutto a discretione. Nota che la lacca bruciata serve per far ombre belliss^{me}.

La coccioniglia come si prepari.—Facciasi bollire con succo di limone, succo d' aglio, et alume bruciato.

La carta di rosseto di Spagna, come s' adopri.—Prima se le darà sopra una mano di succo di limone, poi un' altra d' acqua alluminata, poi un altra di succo di limone, lasciando però s' asciugghi ciascheduna volta prima. Poi bagnando il penello in succo di limone, lo cavarai dalla carta a suo bisogno.

L' azzurro oltramarino come si tempri.—Si mette a molle l' azzurro per una notte in acqua bolita, poi si cava e si tempera con acqua chiara di colla di carnuzza.

Il torna sole come si purghi.—Si purga facendolo bollire con orina, poi si cola e si preme con pensia [pezza?].

Per macinar oro et argento per scrivere e miniare.—Prendasi

painting.—Take of the finest and yellowest gialdolino di Fiandra oz. i ss. and of gold leaf oz. ss., little more or less ; grind them up together with fresh water a little at a time on a piece of porphyry ; then put the mixture in a glass, let it settle and pour off the water. In grinding silver, supply the place of gialdolino with nitre.

27. *A glue which holds as tight as a nail.*—Take Greek pitch, resin of the pine, and powder of baked bricks ; mix them all together, and when it is to be used make it very hot.

28. *How to make ink that will remain black when water is added.*—After the inkstand has once been filled with ink of a good colour, a piece of red orpiment should be put into it, and if a piece of the same [*i. e.* the red orpiment] be put into white of egg, it will keep for a long time without putrefying.

By boiling roche alum in water until one-third of the water has evaporated, and while still hot, washing it over paper with a pencil or sponge, when it is dry you may paint on it even if it were common blotting paper, which is not then liable to blot.

29. *To make a good yellow for writing and miniature painting.*—Take what quantity you please of the berries of buckthorn while they are still green and unripe, bruise them coarsely in a mortar, put them into a vase with enough ley to cover them, and place them to boil over a slow fire until half the ley is consumed ; then strain through a cloth, and put the strained liquor again over the fire, with a little roche alum, not heating it to the boiling point, and when you have done this, put it into shells to dry, and preserve it well-covered from the air.

30. *To make a most beautiful orange-yellow colour.*—Take orpiment, put it in a jeweller's crucible, and melt it over a charcoal fire, then take it from the fire, let it cool, and preserve it, and when you wish to use it, grind it finely, and temper it with gum water.

31. *How pasta verde [sap green] is made.*—Take the grains or berries of the buckthorn when they are quite ripe, and this will be about the end of September ; let them soften for 7 or 8 days in a vase with water in which roche alum has been dissolved in

di gialdolino di fiandra del più fino e giallo 3 i ss., di fogli d'oro 3 ss. poco più o meno, il tutto si macina con acqua fresca poco à poco, sopra pietra di porfido, poi si mette in un bichiero, si lascia posare, e si cola l'acqua; per macinar l'argento si mete in loco del gialdolino, salnitro raffinato.

Colla che tien forte come un chiodo.—Piglia pecce greca, resina picea, e polvere di quadrelli cotti, mescola ogni cosa insieme, e dovendola adoperare falla scaldar bene.

L' inchiostro come si mantenghi negro con aggiungervi acqua.—Dopo ch' una volta sarà aggiustato il calamaro con buona tinta, vi si metta dentro un pezzo di risigallo, e mettendo l'istesso nella chiara d' ovo si conserverà longo tempo senza putrefarsi.

Facendo bollire allume di rocca in acqua che cali duoi terzi, e con quella così calda bagnando la carta con penello o spongia, asciutto che sarà vi si potrà dipingere sopra ancor che fosse carta strazza e leva le macchie.

Per fare un bel giallo da scrivere e miniare.—Piglia quella quantità ti piace di grani o sia pomelli di spincervino ma verdi et immaturi, fracassali nel mortaro grossamente, ponili in uaso con dentro liscia, che basti per coprirli, indi li metterai a lento foco a bollire sino sia consumata quasi la metà della liscia, ciò fatto li collerai per una tella, et la collitura di nuovo metterai al fuoco con un poco di lume di rocca facendola solamente scaldare, finalmente la metterai in conchiglie ad asciugare, e lo difenderai ben coperto dall' aria.

Color giallo ranzo bellissimo.—Piglia orpimento, mettilo in grisolo da orefici e fallo liquefar à fuoco di carboni, indi levalo dal fuoco, lascialo rafredare, e serbalo, e quando vorrai servir-tene, macinalo sottil^{te} e tempralo con acqua di gomma.

Pasta verde come si faccia.—Piglia bacchi o sia granelli di spincervino benissimo maturi, il che sarà la fine di 7^{bre}; lasciali a mogio in un vaso per sette o otto giorni mettendogli dentro acqua nella quale sia disciolto alume di rocca, e sarà per ogni

the proportion of 1 ounce of Alum to 6 of the berries, and boil it well until nearly half the water is consumed; then cool it, strain through a linen cloth, put the part that is strained into pigs' bladders, and dry them in the sun or smoke; and this is called "pasta di vesicha."

32. *How to refine verdigris.*—Take the verdigris, grind it well, steep it in the best vinegar for 3 or 4 days, strain it, then pour the strained liquor on other well-ground verdigris; let it settle for 2 days more, strain it again gently, leaving the lees of the verdigris at the bottom of the vase; put the liquid which has been strained in a glass vessel with a little saffron, and keep it well covered.

32. *A most beautiful green colour.*—Take the powdered verdigris, dissolve it with lemon-juice, and let it settle for 24 hours; then strain the most fluid portion very carefully, leaving the lees at the bottom of the vase. Put the strained liquid into a glass vase, and add to it a little of the above-mentioned pasta verde, let it dry, and when you use it, add to it some more lemon juice, and the more you add the more beautiful the colour will be, so that it will be like an emerald; take care, however, that you do not permit the pencil to touch water.

34. *How to prepare cinnabar for miniature painting.*—Grind the cinnabar on the porphyry with clear water, and let it dry; then put it in a glass vase with urine, mixing the two substances well together; then let it settle, so that the cinnabar will fall to the bottom, and pour off the liquid gently. Then add more urine, mix as before, and continue to do thus for 4 or 5 days, morning and evening, so that the cinnabar will be well purified. Then take some white of egg well beaten with a small piece of dry wood, pour it over the cinnabar to the depth of a finger, mix them well together; let the cinnabar fall to the bottom, and wash it as before for 2 or 3 days, so that the smell will be removed from the cinnabar; and then, when it is well purified, pour in some more white of egg, and mix well together. Leave it thus, and it will be most perfect. When it is used, stir it well.

sei oncie di grani uno d' alume, e cocendo molto bene sino alla consumatione quasi della metà dell' acqua, lasciala raffreddare, si colli per tela di lino, e la collatura si ponghi in vesiche di porco, di poi si mettono a seccare al sole overo al fumo, si chiama pasta di vesicha.

Verde rame come si raffini.—Si piglia il verderame, si tritta bene, poi s' infonde in boniss^{mo} aceto per due o tre giorni, indi si cola, e la colatura, lasciando le fecci, si metti sopra altro verderame ben tritto, si lascia posare per due altri giorni, collasi di novo gentil^{te} lasciando la feccia del verderame nel fondo del vaso, e la collatura liquida si mette in ampola di vetro con poco di zafferano, serbasì ben coperto.

Color verde belliss^{mo}.—Si piglia il verderame pulverisato, si dissolve con succo di limoni, e si lascia posare per hore 24, indi si cola pian piano il più liquido tralasciando le fecci nel fondo del vaso, e la collatura si mette in vaso di vetro, e se gl' aggiunge un poco della sod^{ta} pasta verde, e si lascia sciugare, e quando vorrai servirtene, li aggiongerai altro succo di limone, e quanto più ciò farai, tanto sarà più bello in modo che parerà un sméraldo, avvertendo però che il pennello non tocchi acqua.

Come si prepari il cinaprio per miniare.—Macina il cinaprio sopra il porfido con acqua chiara, e quando sarà macinato, lasciallo seccare, poi mettilo in vaso di vetro con orina sopra, mescolando ben insieme, poi lascialo posare tanto che vadi in fondo, poi getta via l' orina piano, poi metti dell' altra sempre mescolando come prima, e così farai per quattro o cinque giorni, sera e mattina, che sarà beniss^{mo} purgato. Poi habbi chiara d' ouo ben batutta con un legnetto secco, e mettila sopra il cinaprio che sopravanzi un dito, e stempralo bene insieme, lascia andar in fondo il cinaprio, e fa come del orina per doi o tre di, che levarà tutto il tufo al cinaprio, poi essendo ben purgato mettevi altra chiara, e mescola bene e lascia così che sarà perfettiss^{mo}, e volendo adoperare, mescolano bene.

35. *Green for writing.*—Take the black nightshade, extract the juice, strain it, and write with it, and it will answer well. You may also do the same with the juice of rue.

35a. *To make lake, indico, and lamp-black, dry quickly.*—Grind them with oil, then take glass ground to a very fine powder, and incorporate with the colours by grinding them together again; and thus, in the space of 24 hours, they will dry.

36. *To gild the leaves of books.*—Having first put the book in the press, and cut it very evenly, give it a coat of well-beaten white of egg, and let it dry. Then take Armenian bole of the size of a nut, and candied sugar of the size of a small pea, grind them well together dry; then grind them again with well-beaten white of egg, and give the book another coat, neither too thick nor too thin; let it dry; then bathe it with the pencil dipped in clear water; and before it dries, lay on the gold-leaf dexterously with the cotton, and when dry polish with the tooth.

37. *To make a very strong glue.*—It is made with ceruse, minium, umber, and litharge of gold, all well ground up with boiled nut oil, and made into a paste which serves for cementing stones to wooden handles or other parts of small machines, but it ought to be dried in the sun.

38. *Mode of etching on copper or iron with "aqua fortis," and how the said "aqua fortis" is made.*—The plate of copper must be made very even and then burnished, and it must be varnished with a varnish made of wax, mastic, and the smoke of rosin made into a cake by the heat of the fire, then heating the plate of copper in such a manner that when this cake is rubbed over it, it may be liquefied and united smoothly. It is then allowed to cool, and the design is drawn on it with a sharp style, and the plate is then placed so that it may hang over a varnished vessel which contains the aqua fortis made in the following manner:—

39. *"Aqua fortis."*—Pulverize verdigris, sal ammoniac, and galls of Istria, and put the powder into strong vinegar, and

Verde per scrivere.—Piglia solatro ortense, cavane il succo, colalo, e scrivi che riuscirà benissimo. Il mede potrai ancor fare col succo di ruta.

Per far asciugare prestamente la lacca, indico, e negro di fumo. Macinati a olio, si piglia polvere di vetro ben pesta, e macinati sottilm^{te}, poi s'incorpora con li sud^{ti} colori, rimacinandoli di nuovo, e così in spazio di ventiquattro hore s'asciugheranno.

Per indorare le carte de libri.—Primieramente messo il libro nel torcolo tagliato ben uguale le darai una mano di chiara d'ouo ben battuta, e lascia seccare, poi piglia bollo armeno quanto una noce, zuccaro candito quanto un cece, macina bene insieme a secco, indi torna macinare con chiara d'ouo battuta, poi ne darai una mano, che non sia troppo liquido ne troppo spesso sopra il libro, e lascialo seccare, e poi bagnalo con acqua chiara col pennello, et auanti s'asciughi mettili li pezzi d'oro in foglio sopra destramente col bombace, e seccato, liscia con il dente.

Per far colla gagliardiss^{ma}.—Si fa con cerusa, minio, terra d'ombra, e litargirio d'oro, si macina il tutto benissimo con oglio di noce coto, e se ne fa pasta, qual serve per incolare pietre con manichi di legno o d'altra materia per far macinini, ma devesi lasciar seccare al sole.

Modo d'intagliare in rame e ferro con l'acqua forte, e come si faccia d'acqua.—Si prepara la piastra di Rame ben spianata e lustra, e s'invernicarà con vernice fatta con cera, mastice, e fumo di raggia, formandone al calor del fooco una pallotta, poi si fa scaldare la piastra a segno tale che passandovi, e fregandovi sopra detta mistura si liquefaci con unirla legerm^{te} sopra detta piastra, poi si lascerà rafredare, e con un stecco aguzzo farassi il disegno che si vuole, poi si collocherà detta piastra in modo che sia pendente sopra d'un vaso vernicato, nel quale sia l'acqua forte seguente.

Acqua forte.—Pigliasi verderame salarmoniaco, aceto forte, e galla d'Istria, il tutto polverizzato, e messo nel detto aceto,

after beating it continually with a spoon or "spatula" for four hours, pour it over the suspended plate (but if you have to engrave on iron, instead of the sal ammoniac, put to it some corrosive sublimate), and let that water remain on the plate for the space of 6 or 8 hours.

40. *To make the colours stand in fresco.*—They should be distemperd with milk; this is found to succeed wonderfully, especially with the smalti and smaltini.

41. *Verdigris for painting in water-colours.*—Take of verdigris oz. vj, and of refined tartar of wine about oz. j, pound them both separately. The verdigris is to be put with half a bocale of very strong vinegar, weighing about oz. xij, into a new pipkin, and to be allowed to boil until, on a pencil being dipped in the vinegar, it will be seen to stain a piece of paper.

During the boiling the above-mentioned tartar must be added, and when it is done it must be placed, cold, in a glass flask, together with what remains at the bottom, and the water must be allowed to clear; and if, when it is used, the colour is too deep, more strong vinegar may be added, and while it is used the pencil must not be allowed to touch clear water.

Remember that the pipkin must not be uncovered during the boiling, lest the vinegar should evaporate; a small hole in the cover, large enough to admit a small piece of wood, will be quite sufficient for stirring the mixture while it boils.

42. *To lay the colours on silver for flowers* [for ornamenting]:—After you have laid on the silver, take lake and whatever colour you please, grind it up well with pure water, and give the silver 3 coats, one thin and the other two thicker; and when it is dry, draw the ornamental foliage or other works with the style, and then apply the varnish warm.

43. *To lay gold on sandals, paper, or other things.*—First apply a coat of strong Lyons' glue (?), in which you will boil some white lead and yellow earth ground up together with a little honey; then gild, and it will succeed wonderfully.

44. *Oil gilding on stone.*—Take nut oil which has been boiled with litharge of gold, yellow earth, and minium, well

qual poi per quattro hore continue si fa passare sbattendolo con cucchiaro, o palletta sopra d^{ta} piastra pendente, ma dovendosi intagliare in ferro, in loco del sal armoniaco, si mette in d^{ta} acqua del solimato, qual acqua si lascia passarvi sopra la piastra per lo spacio di sei o otto hore.

Per far restare i colori a fresco.—Si deuno stemperare con latte, e ciò riesse benissimo, massime ne smalti e smaltini.

Acquarella di verderame.—Si piglia di verderame 3 vj, si pesta benissimo, poi si pesta di tartaro di Bote raffinato 3 j circa.

Si mette d^o verderame in un pignatino novo con mezo bocalo d' aceto fortissimo come sarebbe 3 xij e si lascia bollire poi fintantoche pigliando un pennello, e bagnandolo in d^o aceto si vedrà tinger bene la carta.

A mezo il boglio se li metterà il tartaro sud^o, e doppo che sarà fatto si metterà freddo in una caraffa di vetro, insieme con la residenza che sarà in fondo, e si lascerà chiarir l' acqua, la quale quando nell' adoperarla restasse col color troppo carico, se le potrà aggiungere nel ampola altro aceto forte, ne bisogna nel adoperarla che il pennello tocchi acqua chiara.

Avertasi nel bollir à non lasciar il pignatino scoperto acciò non svapori, bastando un piccolo pertuggio nel coperto per mettervi dentro nel bucco un legnetto, e mescolar il tutto mentre bolle.

Per metter colori sopra argento per fiorire.—Dopo ch' hauerai dato l' argento, piglia lacca, e qual si voglia colore, e macinalo bene con acqua semplice, e ne darai tre mani sopra l' argento, una chiara, e l' altre due più spesse, e sciugato farai i fiorami o lavori con stecco indi li darai la vernice calda.

Per metter oro sopra zendalo carta o altro.—Prima darai una mano di colla forte di lione, nella quale bollirai un poco di mele con biacca, o terra gialda macinati insieme, indi metterai l' oro e riuscirà benissimo.

Per metter oro sopra pietra a oglio.—Prendi oglio di noce bollito con litargirio d' oro, e terra gialda, e minio ben macinati,

ground ; give three coats of this, and let it remain thus for 2 or 3 days, when you will lay on the gold.

45. *A clear and fine varnish.*—Take of clear Venice turpentine oz. iij, and of odoriferous oil of spike oz. j, melt them well together over a slow fire, and use the varnish hot, recollecting that if you are using it on wood you must first give it a good coat of glue, or distemper the colours with gum water, in order that the varnish may not penetrate.

46. *A varnish which has been tried.*—Take equal parts of white mastic and linseed oil, put them into a new pipkin over a slow fire, and when the oil is hot, add to it a little “olio d’ abezzo,” and continue to mix.

47. *Another good varnish.*—Take equal quantities of red mastic well powdered and linseed oil with a little resin ; put them over the fire in a new pipkin, stirring the ingredients continually for a quarter of an hour, when it will be finished.

48. *Another varnish.*—Take of oglio d’ abezzo, naphtha, and white mastic, all at discretion ; put the whole into a new pipkin over a slow fire, and boil until all the mastic is dissolved ; if there is plenty of the olio di abezzo the varnish will be better.

49. *A varnish which dries directly.*—Take equal parts of boiled linseed oil and white mastic, place them over the fire in a new pipkin with a little oglio di abezzo ; let them boil while you can say a credo ; then add to them spirit of turpentine, equal in quantity to half the linseed oil, mixing it well with the other ingredients.

50. *Another varnish which dries directly.*—Put into a pipkin a proper quantity of mastic, cover it with a somewhat greater quantity of naphtha, and leave the pipkin over the hot coals until the mastic is dissolved.

51. *A varnish which does not dry immediately.*—Take of white mastic oz. j, of nut or linseed oil oz. ij, and of oglio di abezzo oz. ss ; put the whole into a pipkin, and boil over a slow

e ne darai tre mani, e lascerai stare così per due o tre giorni, indi darai l'oro.

Vernice sottilla e chiara.—Piglia trementina di Venetia chiara 3 iij, oglio di spico odorifero 3 j, fa fondere bene insieme a lento foco, poi la darai caldo a tuo modo, auertendo di dar prima una buona mano di colla sopra se sarà lavoro di legno, ovvero stempererai li collori con acqua gommata acciò la vernice non trapassi.

Vernice provata.—Piglia mastice bianco et olio di lino, di ciascuno parti uguali, metti ogni cosa in un pignatino nouo al foco lento, e come sarà caldo l'olio, metterai dentro un poco d'oglio d'abezzo e mescola sempre.

Altra vernice bona.—Mastice rosso ben pesto, et oglio di lino, tanto dell'uno quanto dell'altro, con poco di Raggia, metti ogni cosa in pignatino nouo al fuoco, mescolando sempre per lo spatio d'un quarto d'ora, et è fatta.

Altra vernice.—Si piglia oglio d'abezzo, e oglio di sasso e mastice bianco, il tutto a discretione, si pone il tutto in pignatino a foco lento, e si fa bollir sin tanto che il mastice sia disfatto, e sarà più gagliarda con assai abezzo.

Vernice che subito s'asciuga.—Ooglio di lino cotto con mastice bianco, parti uguali, pongasi in pignatino nouo con poco d'oglio d'abezzo al fuoco, lascia bollir per spacio d'un credo, poi metti dentro un poco d'acqua di raggia, tantoche sia per mettà del oglio di lino mescolando sempre.

Altra vernice che subito asciuga.—Metti in pignatino tanto mastice quanto ti piace, copriilo con olio di sasso che sopravanzi un poco, lascia il pignatino sopra le ceneri calde sintanto che sia disfatto il mastice.

Vernice ch'aspetta.—Di mastice bianco 3 j, olio di noce over di lino 3 ij, d'oglio d'abezzo 3 ss., metti ogni cosa in un pignatino, e fa bollire a foco lento sin tanto sia disfatto il mastice, poi mettegli dentro poco oglio di sasso a discretione.

fire until all the mastic is dissolved ; then add a little naphtha at discretion.

52. *A varnish which has been proved to dry instantly.*—Take of coarsely pounded white mastic oz. j, of spirit of turpentine oz. j, of naphtha oz j, and of oglio di abezzo oz. ij ; put all the ingredients into a glass vessel closely covered with paper ; then put a tin pot over the fire, to the handle of which the glass must be suspended, being secured to it by a string ; and put into the tin pot sufficient water to cover the glass. Boil the water for half an hour, and until the mastic is dissolved, taking care not to take out the glass while the water is boiling, as it would crack.

53. *Another varnish.*—Let any quantity of oglio di abezzo, naphtha, and mastic, be placed in a pipkin in the summer and exposed to the sun, and in this way excellent varnish will be made.

54. *How to wash old pictures previous to varnishing them.*—Take tartar and black soap, and boil them with water. With this old paintings are washed, and afterwards varnished with the following varnish.

55. *A varnish for old pictures.*—Take linseed or nut oil, oil of spike, and powdered mastic, all at discretion ; put them into a pipkin over a slow fire. This is found to succeed.

56. *Another mode of washing old paintings.*—Take some weak ley and soap with a little of that amalgam¹ which is used for the backs of mirrors, and rub the amalgam all over the picture ; leave it in that state for a short time, then wash it off with a new ley, and lastly wash off the whole with common water. This has been tried.

57. *A varnish which does not dry immediately.*—Take a

¹ Amalgam for the backs of looking glasses. The process of silvering mirrors at Murano was described by Porta to be as follows:—"The tin, hammered to thin leaves, was spread out very smoothly, and quicksilver was poured over it ; and when the tin was saturated it was covered with paper. The glass, wiped exceedingly clean, was then laid above it, and while the workman pressed it down with his left hand, he drew out very

Vernice che subito sciuga—provata.—Di mastice bianco mezo pesto 3 j, d' acqua di raggia 3 j, d' oglio di sasso 3 j, oglio d' abezzo 3 ij, metta ogni cosa in un ampolla ben otturata con carta poi metti una stagnata al foco, et in essa metti l' ampola che con spago sia legata sospesa al manico, e metti nella stagnata tant' acqua che copra l' ampola, fa bollir l' acqua per spacio di mez' hora, e sin tanto che il mastice sia disfato, avertendo di non tirar fuori l' ampola dal acqua nel tempo che bolle, perche l' ampola creperebbe.

Altra vernice.—Oglio d' abezzo, oglio di sasso, e mastice, ogni cosa a discrezione, pongansi in pignatino l' estate al sole, che in questo modo si fa perfett^{ma}.

Come si lavino li quadri vecchi nanti di dargli la vernice.—Si piglia alume di feccia, e sapon negro, si fa bollir con l' acqua, e con quella si lauono bene i quadri vechi: poi se li da la seguente vernice.

Vernice da darsi à quadri vecchi.—Si piglia oglio di lino, ouero oglio di noce, oglio di spico, et mastice pesto, ogni cosa a discrezione si mette in pignatino a foco lento, e riesce.

Altro modo di lavar quadri vecchi.—Si piglia della liscia dolce, e sapone con un poco di quel stagnolo che sta dietro i specchi, e si va con deto stagniolo sfregaciando sopra il quadro, e vi si lascia stare poco, poi si lava giù detto stagnolo con noua liscia, poi con acqua comune si lava giù ogni cosa—provato.

Vernice che aspetta assai.—Piglia un pignatino e poni mastice

carefully with his right the paper that lay between the tin and the glass, over which weights were afterwards placed." In Germany, however, according to Garzoni, an amalgam was used, composed of a mixture of lead, tin, the silver marchesite, and tartar; while Porta says the mixture consisted of antimony, lead, and colophonium. (See Beckmann's 'Inventions,' vol. ii. p. 78, 79.)

pipkin, and put into it white mastic, linseed, or nut oil, at discretion; then boil it over a slow fire until all the mastic is dissolved.

58. *Mode of preparing lime for fresco painting.*—Take quicklime, quench it in water; then grind it well with water, and after it is ground place it on a stone impervious to water; let it dry, and it will then be ready for use.

59. *A varnish for picture-frames coloured like walnut wood.*—Take a pipkin and pour into it a proper quantity of the strongest spirit of wine, add to it some dry pine resin in the following proportions, namely: of resin, a piece equal in bulk to 5 nuts to a drinking glass of spirit; then put the pipkin over the fire, and when the resin is dissolved, the varnish will be finished; but take care that the flame does not approach the pipkin. You may then use it on any work you please, but remember that dust before it is dry will injure it much.

60. *Secret for writing with leaf gold.*—If you wish to write with gold on parchment or paper, take of candied sugar oz ij, and fine ochre oz. j; grind them well on a colour-grinder's slab, then distemper with urine or barber's ley, and make the mixture so liquid that you can write with it. Then prepare your pen, and write on the paper as if you were writing with ink. When you have finished writing, let it dry well; then take up the gold on some small pieces of cotton, breathe on the letters so that they will become rather moist, and then apply the gold dexterously, pressing it slightly with the cotton. In this manner the gold will remain fastened to the letters, and you must then rub gently with paper or something else on that part which is not written on to remove the loose gold; and if the letters should be capitals, like the Roman letters, you may with a penknife proceed to take off the gold where it is not wanted. If in any place the gold does not adhere to the letters, you may put on some more; and lest that also should not adhere, you may retouch the letters with the above-mentioned mixture, and again apply the gold when the composition is dry; and this is

bianco et oglio di lino o di noce a discretione fa bollir a lento foco sin che il mastice sia disfatto.

Modo d' accomodar la calcina per servirsene a fresco.—Piglia calcina viva, e strugila in acqua, poi macinala bene con acqua, e dopo macinata ponila sopra pietra viva, lasciala seccare, e adoprela.

Vernice da dare a Cornici colorite di color di noce.—Si piglia un pignati^{no}, e dentro vi si mette dell' acqua vita galiar-diss^{ma} quella quantità si uol fare, e poi vi si mette dentro della raggia di pino secca, cioè in un bichiero d' acqua vita, si ponerà tanta raggia quanto sarà cinque noci in circa, poi si mete al foco, et a forza di foco si fa disfare, e come sarà disfata la raggia all' hora sarà fatta. Ma avverti di non lasciar accostar la vampa del foco al pignatino, quella poi si da al lavoro che ti piace, avvertendo che la polvere le fa danno non asciuta.

Segreto per scrivere con oro in foglio.—Volendo scrivere con oro in carta pecorina o altra carta, piglia Zuccaro candito 3 ij, ocrea fina 3 j, macina sottilm^{te} sopra una pietra da macinar colori, poi distempera con orina, overo liscia di barbiero, e lafarai tanto liquida, che si possi con essa scrivere, poi accomoda la tua penna, e scrivi sopra la carta come se scrivessi con l' inchiostro, e quando haverai fornito di scrivere, lascia asciugare bene, poi piglia l' oro sopra un poco di bombace a pezzetti, e con il fiato li soffierai sopra le lettere tanto che doventi un poco humida poi va applicando destramente l' oro premendolo alquanto col bombace, che in questa maniera resterà l' oro attaccato alla lettera, e dove non è scritto se ne anderà via fregando legier^{te} con una carta o altra cosa, e se le lettere fossero Miuscele (sic) come le Romane con un temperino li puoi andar rappezzando, e levar l' oro dove non fà bisogno, e se in alcun loco l' oro non fosse attaccato ne porai dell' altro, e caso che non s' attaccasse, si ritocca con la mistura sud^{ta}, poi ponivi l' oro dopo asciugata e così si fa. E se vuoi fare in altro modo più facile, piglia succo d' aglio e con quello scrivi, e lascia asciugare indi metti sopra

the manner in which letters are gilded. And if you would gild in an easier manner, take garlic juice, write with it, let it dry, and lay on the gold in the above-mentioned manner. But this mode does not please me on account of the smell.

61. *How very fine ink is made.*—Take of strong white wine lb. 8, and of well broken galls of Istria oz. viij, put them together in a glazed vase, and expose them to the heat of the sun or in a covered furnace for 8 days, stirring them frequently; then separate the wine from the galls, strain it, and add to it of Roman vitriol oz. vj, and leave it in the shade for a week longer, stirring it frequently. Then take of gum arabic oz. ij, dissolve it in a pint of rose-water, and for 8 days more continue to mix this with the wine, at the end of which time use the ink with a little boiled wine, and you will find it good.

62. *To write with cinnabar.*—Among all the methods tried, the following is esteemed the best:—Take the whites of two fresh eggs, and put them into a new pipkin; then break the bough of a fig-tree, containing the milk, into minute pieces, which you will add to the eggs; and with another fig-tree bough beat the mixture up until the white of egg is well broken. Then strain it through a fine linen rag, and place it in a well closed glass vessel, with an equal quantity of roche alum. Distemper your cinnabar with this white of egg, which must be first well ground with clear water, and dried so that you can write with it, and you must mix it well in using it.

In order to preserve the white of egg for a year, take red orpiment of the bulk of a chestnut, and put it in the white of egg, which consequently will never spoil; and this serves for grinding the gold for writing.

63. *How to prepare indico so that when used it shall be beautiful.*—Grind it well with simple water, dry it on paper in the shade, grind it again with urine, and again dry it. When you wish to use it thus in powder, mix it with white lead with as little oil as possible, and it will thus be beautiful when used, if you first grind up the white lead very finely, and then distemper the indico.

l' oro al modo che di sopra s' è detto, ma per l' odore non mi piace.

Inchiostro finiss^{mo} come si faccia.—Vin bianco galiardo lb. 8, Galla d' Istria ben franta 3 viij, quale per otto giorni stia nel vino in vaso vitriato al sole, o nel fornello coperto mescolandoli spesso, poi separato il vino dalla galla, e collandolo, mettivi vitriolo Romano 3 vj, e stiavi dentro altri otto giorni all' ombra mescolandolo spesso, poi piglia di gomma arabica 3 ij e posta in O j acqua rosa, et per altri otto giorni mescola col vino, nel qual tempo con poco di vin coto, et incorporate insieme, te ne servirai, e sarà bono.

Per scrivere con cinaprio.—Fra tutte le maniere provate questa si stima boniss^{ma}. Pigliarai dunque la chiara di due oua fresche e messa in scudella nova, romperai una bachelletta di fico verde che habi il late in minuti pezzi, e la porai nella chiara, e con una bachelletta pure di fico la sbatterai sino che la chiara sia ben dirota, il che fatto colerai per pezza di lino sottile, e la porai in vaso di vetro ben turato, e vi porai altrettanto alume di rocca. Distempra il cinaprio con questa chiara che sii prima ben macinato con acqua chiara, et asciugato in modo che possi scrivere, e l' anderai mescolando nel adoprarlo.

Per conservare un anno la chiara d' ovo, piglia tanto risigalo, come una castagna, e ponili nella chiara, che mai si guasterà, e questa serve per macinar l' oro per scrivere.

Come s' accomodi l' indico che in opra resti bello.—Macinalo bene con acqua semplice, poi mettilo a seccare sopra carta all' ombra, e poi tornalo a macinare con orina, e tornalo a seccare, e quando si vol adoprare così in polvere mischiato con la biacca con manc' olio si potrà, e così resterà bello in opra macinando prima la biacca un poco tenera poi stemperai l' indico.

64. *How to purify cinnabar and minium for miniature painting.*—If you wish cinnabar and minium to be beautiful, grind them with fresh urine, and it will succeed well.

65. *A secret for making an unequalled green.*—Take the purple lilies, that is, the flowers, and of these the petals only are to be used, and pound them until they are well bruised, and leave them until they begin to ferment; then take burnt roche alum at discretion, grind and incorporate it well with the lilies, leave them on the grindstone for 5 or 6 hours; then prepare the shells, and take a worn linen rag, put the lilies into it, and press the juice dexterously into the shells or vases; then dry the colour in the shade, and you will have a beautiful green; and if you wish to make the colour lighter, add to it a little quicklime at discretion.

66. *To prepare lampblack for outlining the gold in crimson.*—Distemper it with ox-gall, then let it dry in the sun, and when you use it grind it with gum water.

67. *To make aqua fortis.*¹—Take one pint of the strongest vinegar, oz. iiij of verdigris, oz. vj of sal ammoniac, oz. vj of common salt, oz. ij of arsenic, and boil them until one-third of the mixture has evaporated.

68. *Paste for the aqua fortis.*—Take of Greek pitch oz. j, of wax oz. 1 ss, and of gum arabic oz. ij; liquefy and melt these ingredients in water, and make a cerate, which must be rubbed gently all over the previously heated iron; it must then be blackened by the smoke of a lantern, after which the design must be drawn with the needle. You must then put wax round it like a box; and the space thus enclosed must be filled with aqua fortis, which must be left there for 4 or 6 hours.

69. *To write green letters.*—Take strong vinegar, powdered gum arabic, verdigris, and roche alum, all at discretion, mixed with the juice of rue, and made so liquid that the mixture will flow like ink.

70. *To make paper transparent as glass.*—Take of nut oil lb. ss. and of powdered white litharge oz. j ss, mix them well in a

¹ The aqua fortis and paste were for etching.

Come si purghi il cinaprio et minio per miniare.—Volendo che il cinaprio o minio venghi bello, macinalo con orina che sia subito fata, e riuscirà.

Segreto per fare un verde che non ha pari.—Si piglia i Gilij Pauonazzi, cioè i fiori, e si piglia le semplici foglie poi si pestano tanto che siano amaccati, e si lasciano principiar a putrefarsi, piglia poi alume di rocca bruciato a discretione, e con l' alume macina li gilii, et incorpora bene l' alume, e poi lasciali sul macinino per cinque o sei hore, poi prepara le conchilie, e piglia una pezza di lino usata, e metti li Gilij dentro, e con destrezza va premendo sopra le conchilie o vasi, e lascerai seccare all' ombra et haverai un bel verde, e volendolo far più chiaro vi porrai un poco di calcina viva a tua discretione.

Per accomodar negro di fumo per profilar l' oro in cremesino.—Si distempra con fiel di bue, poi si mette a sciugar al sole e dovendolo adoperare si macina con acqua gommata.

Per far acqua forte.—Una pinta d' accetto fortiss^{mo} verderame 3 iij sal armoniaco 3 vj sal comune 3 vj arsenico 3 ij bollito insieme e consumato il terzo.

Pasta per l' acqua forte.—R. Pece Greca 3 j cera 3 l ss., goma arabica 3 ij, il tutto liquefatto e fuso in acqua, se ne forma cerotto, il quale scaldato prima il ferro si toccherà sottilm^{te}, e tutto si farà negro sopra il fumo della lucerna, poi con l' ago si farà il disegno, e si porà della cera attorno a foggia di scatola, e s' empirà il luogo di d^{ta} acqua forte, e si lascerà per spacio di 4 o 6 hore.

Per scrivere lettere verdi.—Si piglia accetto forte, gomma arabica in polvere, verderame, alume di rocca, tutto a discretione, mescolati con succo di ruta, e si fa liquido in modo che possa correre a modo d' inchiostro.

Per far cartu trasparente come vetro.—R. Oglio di noce lb. ss. litargirio bianco polverizzato 3 j ss. il tutto mescolato in-

new pipkin, and heat them gently for the space of an hour, but do not boil them. Let the mixture then settle for 24 hours, and pour this purified oil into another pipkin with $\frac{3}{4}$ viij of powdered white Greek pitch, and dissolve them gently by heating them without boiling as above.

71. *To make white bone black.*—Take of litharge and quicklime each oz. 6, mix them with common water, and place them over the fire to boil; put in the white bone, stirring continually until the water boils. Then take the vessel from the fire, and do not cease stirring until the water is cold, when the bone will be black.

72. *To make bone as soft as wax.*—Take equal quantities of Roman vitriol and common salt, pound them well, put them into an alembic and distil them, and preserve the water, and when you wish to soften the bone, put it in this water, and it will become soft as wax.

73. *To make white bone green.*—Take a bocale of strong vinegar, of powdered verdigris and brass filings each oz. 3, and of rue j. handful. Pound each ingredient, put them all together into a glazed vase with the bone; close up the mouth of the vase, and put it in a cellar for a fortnight, when the bone will be green.

74. *A most beautiful green for miniature painting.*—Take equal quantities of verdigris, litharge of gold, and quicksilver, grind them all to a fine powder with urine, and put them into a bottle, which you must bury in horse dung for 20 days; then take it out, grind the verdigris again, and you will have a most noble green for miniatures, writing, and painting.

75. *To change bone to a most beautiful green colour.*—Take well pounded verdigris, steep it in goat's milk and leave it until it becomes green; then put it into a copper vase with the bone, close up the vase air tight, bury it in dung for a week, when you will find the bone of a green colour, which will be still more beautiful if the bone is afterwards boiled in nut oil.

76. *Another way of making transparent paper.*—Take warm olio di abezzo; there is nothing better.

77. *To make rosetto di verzino.*—Take verzino or red sandal

sieme in pignatino novo, si fa lentamente scaldare per lo spacio d' un hora ma però non bolli, così fatto lasciassi posare per hore 24, poi si mete in un'altra pignata il d^{to} oglio purificato con 3 viij di pece greca pesta e bianca, e si farà fondere a puoco a puoco ma che non bolli come sopra.

Osso bianco che diventi negro.—Litargirio, calce viva, an. oz 6, mistica con l' acqua comune e meti a bollire, e ponivi l' osso bianco sempre menando per fin che comincia a bollire, e levalo dal foco, e non restar di menare sin che l' acqua si raffreddi e sarà negro.

Osso come si facci mole come cera.—Piglia vitriolo Romano sal com. an. e ben pesti mettili in lambico, e distila e serva l' acqua, e quando vorai molificare l' osso mettilo dentro la d^{ta} acqua, e verà mole come cera.

Osso bianco che diventi verde.—Accetto forte boccali uno, verderame polverizzato, limatura d' ottone, an. oz. 3; ruta man. j, pesta ogni cosa, e metti in vaso invitriato, e metti l' osso dentro, e tura il vaso bene, e metti il detto vaso in cantina per quindici di, e saranno verdi.

Verde belliss^{mo} per miniare.—R. verderame, litargirio d' oro, argento vivo an: macina tutto insieme sottil^{te} con orina di puto, e poni il tutto in boccia sepelita in lettame di cavallo per venti giorni, e poi cavalo fuori, e di novo tornalo a macinare, et have-
rai verde nobiliss^{mo} per miniare, scrivere, e dipingere.

Per far osso verde bellissimo.—Piglia verderame ben rotto, e ponilo in latte di capra e lascialo sino che diviene verde, di poi metilo in vaso di rame e ponivi l' osso, poi copri benissimo che non sfiati, e ponilo in letame otto giorni, e lo troverai verde, e con farlo bollire nel oglio di noce, sarà più bello.

Per far carta lucida in altro modo.—Piglia oglio d' abezzo caldo per farla belliss^{ma} non v' è meglio.

A fare rossetto di verzino.—Piglia verzino overo sandali rossi,

wood, cut it into small pieces, and soften it in rain water, in which it is to be left for three days ; then boil it until the water is reduced to half its original quantity, and for every pound add oz. 1. of roche alum with a scruple of gum arabic, and boil it until all the ingredients are liquefied, strain it, and it will be finished.

78. *Mode of colouring bones so that they will appear like emeralds.*—Take aqua fortis which dissolves metals and let it dissolve as much brass or copper as it will, put into it the bone which you wish to colour, having first carved it as you please, and leave it in the water for one night, when its colour will be beautiful.

79. *To make a beautiful green.*—Take the ripe berries of the buckthorn, pound them, boil them with roche alum water, and incorporate with them some of the yellow made from the buckthorn and a little saffron, and thus a most beautiful green will be made.

80. *To make brazil wood of four colours.*—Take brazil wood, and steep any quantity you please (so that it is more than a third part) in clear water until the colour is very red. Then divide this colour into 4 parts: if you wish to make a rose colour use it pure ; if you wish it purple add lime water, but the water must be tepid ; if you wish a violet colour add a ley to it ; and if you desire that it should be of a mulberry colour add tartar.

81. *To make a green for writing and miniature painting.*—Take verdigris, litharge, and quicksilver ; grind them all together with urine, and write or paint with this, which will be beautiful, and of the colour of an emerald.

82. *To make a green for miniatures and painting.*—Take verdigris, dissolve it with vinegar, and when it is well dissolved strain it through a fine cloth ; then grind it up well on the porphyry slab with clear water, adding honey during the grinding. Let it dry, and again grind it up with gum water, and it will be done.

83. *To render any colour more brilliant and permanent.* —Take

e taglia sottilm^{te} e mettansi a molle in acqua piovana, e lasciali per tre giorni, e poi falli bollire al calo della metà, e per ogni lib. agiongi oz. uno alume di rocca, et un scrupolo di gomma arabica, e facciasi bollire, tanto che le d^{te} cose siano liquefate, e colalo che sarà fatto.

Modo di tingere ossa che parerano smeraldi.—Piglia acqua forte da partire, et falle mangiare, e dissolvere tanto rame, o ottone quanto ne può dissolvere, et in essa metti le ossa che voi tingere, havendole prima fate lavorare a tuo modo e lasciali in d^{ta} acqua una notte, e saranno belliss^{mi}.

A fare un bel verde.—Piglia bacche di spincervino ben mature, e pestali, e falli ben bollire con aqua d' alume di rocca, e incorpora giallo di spincervino e un poco di zaffarano, e sarà fato un verde belliss^{mo}.

A fare il verzino in quattro colori.—Piglia verzino e concialo in acqua chiara quella quantità che voi tanto che sia più del terzo, e tanto che il color sia ben rosso. Poi parti questo colore in quattro parti; e volendo fare color rosato adopralo come si trova, e volendo pavonazzo, aggiungi acqua di calcina, averti che il verzino vol tepido, se violato poni liscia, e se lo voi morello poni alume di feccia.

A far verde per scrivere e miniare.—R. verderame, litargirio, et argento vivo, e trita tutto insieme con orina di putto e scrivi o minia che sarà belliss^{mo} e sarà colore di smeraldo.

A far verde per miniare e dipingere.—R. verderame e con accetto il farai disfare, e quando sarà ben disfatto il colerai con pano sottile, e poi lo macinarai sul porfido bene con acqua chiara e vi porai del miele nel macinarlo, e lascialo poi sciugare, poi ritorna a macinarlo con acqua gommata e sarà fato.

Ut vividior, et maxime constans quilibet reddatur color.—R.

the rectified spirit of urine in a glass phial, and mix your colour with this. Leave it, mixed, in the gentle heat of ashes, or of hot water, for half an hour, the mouth of the phial being stopped. Then separate the colour from the spirit, and you will find it more florid, and much more permanent. But if the spirit is not to be obtained, a ley prepared from calcined tartar, nitro fixo,¹ and the salt of urine may be used.

If in this ley are boiled crimson woollen cloths, a most wonderful cochineal colour is obtained, which is commonly called "scarlato col secreto." The same may be said of the other colours.

If copper is dissolved in the spirit of nitre [nitric acid] and then precipitated by a solution of salt of tartar, there will be a green colour much less corrosive than the other colours.

If by the same spirit ceruse is dissolved, and then precipitated by a solution of gold, there will be a very white and delicate colour.

84. *To make green letters.*—Take the juice of rue, verdigris, and saffron, grind them together, and write with gum water.

85. *To make blue ink.*—Take "endico bagatello," grind it to a fine powder, liquefy it with the above-mentioned gum water, and if you wish the colour to be very fine add to it roche alum (without gum water it would not flow well), and it is then finished.

86. *To make the lily green.*—Take the purple lilies, pick off the most highly coloured petals, and leave them to ferment for a day; then pound them in a mortar, put the juice in a cup, then tie up some quicklime and alum in a piece of linen rag, put it into the juice, stirring it about until the green colour is developed; then keep it dry in paper, and let it be made in fine weather.

87. *Mode of extracting the colour of brazil wood.*—Take of rasped or filed brazil wood, say, oz. 2, and white of egg at discretion, but in sufficient quantity to soak the brazil wood; then take two-eighths of burnt roche alum, and put the whole together in a pipkin, and stir it with a wooden spatula until you see that

¹ Nitre deflagrated in a crucible along with charcoal. See Nuovo Plico, p. 123.

spiritum defecatum urinæ in vitrea phiala, cum eo misce colorem. Relinque mixtum in leni cinerum vel aquæ calidæ calore, per semihoram clauso phiale ore. Separa deinde colorem a spiritu et invenies floridiorem, maximeque constantem, loco spiritu urinæ si desit adhiberi potest lixivium ex tartaro calcinato nitro fixo, et urinæ sale confectum.

Si in hoc lixivio coquantur vellera panni carmesini extrahetur inde color mirificus coccineus qui vulgo dicitur scarlato col secreto idem dic de cæteris coloribus.

Si nitri spiritum solvatur cuprum, ac deinde lixivio salis tartari præcipitetur habebitur color viridis alios colores minime rodens.

Si eodem spiritu solvatur cerusa, ac deinde solis aqua præcipitetur, habebitur candidissimus delicatissimusque color.

A far lettere verdi.—R. ruta e cavane il succo, verderame, e zafferano e macina insieme, e scrivi con acqua gommata.

A far inchiostro turchino.—R. endico bagatello macinalo sottile, e liquefalo con acqua di gomma della soprad^{ta}, e chi lo vol fare belliss^{mo} li meta alume di rocca, e senza acqua di gomma non correrebbe ed è fatto.

Per fare il verde gilio.—Si piglia i gilij pavonazzi, e se li levano le parte più colorite poi si pone per un giorno a putrefarsi, poi si pestano in mortaro, e si cava il suco, si pone in tazza, poi si mete calce viva et alume, e messo in pezza di lino si pone nel detto suco facendolo girare sin che si vede ricavato il colore verde e conserva poi asciuto in carta, e si fa in tempo bono.

Modo di cavar il colore dal brasile.—Piglia il brasile raspatto o limato u. g. (sic) oz. 2. piglia bianchi d' ova a discretione che tutto resti inzuppato, poi piglia due ottavi alume di rocca abbruciato, e il tutto metti insieme dentro una scudella poi con spatola di legno rimena il tutto sintanto che vedrai il tutto ben colorito,

the whole is well coloured, strain it through a linen rag, and immediately expose it to the sun that it may dry; and if you wish to make a beautiful purple, take Campeachy wood (?), and do the same with that.

88. *To make the Indian varnish. First notice.*—You must first heat an earthen vase, and while it is very hot put into it the gum lac pounded and sifted through a silk sieve; then add to it about $\frac{1}{2}$ of an ounce of colophony, and at the same time, that it may have a body, collect it on the end of a stick in order to present all parts of it to the fire, that it may all be of the same colour, and as soon as it is liquefied you will add to it, a little at a time, the powdered colours, observing that they must be quite dry when they are put in.

89. *For green.*—Take 15 drachms of orpiment, a drachm of indico, more or less dark in colour, for the sky-blue, sulphur well pounded with indico at discretion, and so with the other colours. After the colours are well mixed on their sticks with the gum lac they must be frequently beaten on the marble, or in a hot mortar, in order to mix them well; they are afterwards worked in the hands, and little tablets are made of them for use when they are wanted. For dark blue, indico alone; for yellow, orpiment; for red, cinnabar or minium; for olive, burnt orpiment; for flesh colour, sulphur and minium; and so for all the other colours.

90. *To extract the colour of the gum lac, so that it will serve for bright colours.*—Pulverize coarsely the gum, and put it into a ley of rosewood or vinewood, which will extract its colour; you must then separate the water from the gum, and evaporate it carefully until it begins to thicken. You must then take it from the fire, and stir it with a silver spoon, and let it settle till the next morning, and when it is sufficiently thick, you must place it on a slab of marble, dry it and use it for giving a lustre to the gum and to all colours. Observe that this colour mixed with white lead makes a most beautiful flesh colour.

The remainder of the gum lac must be washed in the ley until it has entirely lost its red colour; it will then do for melt-

colla per pezza, e poni al sole subito a seccare; se voi fare un bel pavonazzo, piglia il campuccio e fa l' istesso.

Per fare la vernice indiana, p^o avvertimento.—Bisogna far scaldare un vaso di terra, essendo ben caldo metti della gomma lacca pesta e crivelata al setazzino di seta, ponivi insieme circa $\frac{1}{2}$ d' oz. collofonia e nell' istesso tempo ch' haverà fatto corpo, la coglierete alla cima d' un bastone per presentarla al foco voltandola da tutte le parti a fin che prendi ugualm^{te} il colore, e subito liquefatta che sarà, li metterai a poco a poco li collori ben pesti osservando che siano ben secchi nel ponerli.

Per il verde.—Vi bisognano 15 dramme d' orpimento, e una dramma d' indico più o meno oscuro, per il turchino solfarò ben pesto con indico a discrezione, e così dell' altri colori. Doppo che li colori saranno ben mescolati sopra li bastoni con la gomma lacca, bisogna batterli sopra il marmo, o dentro un mortaro caldo molte volte per renderlo ben mescolato, e dopo voltarlo nelle mani e farne tavolette, per servirsene ne bisogni, il turchino scuro, l' indico solo, il giallo l' orpimento, il rosso il cinaprio, o minio, color d' oliva orpimento abbruciato, color di carne, solfaro e minio, e così di tutti li altri colori.

Per tirare il colore della gomma lacca che serve per li colori vivi.—Polveriza grossam^{te} la detta gomma, e ponila in liscia di legno di rosa o di vite, e la detta liscia tirerà il colore, bisogna separare le acque dalla gomma, e farle svaporare sottil^{te} sin tanto ch' essa cominci a divenir spessa. All' hora bisogna levarla dal fuoco, e moverla con un chuchiaro d' argento, poi lasciarla riposare insino alla mattina, e quando haverà fatto corpo, metterla sopra una pietra di marmo e farla seccare, e ve ne servirete per dare il lustro alla gomma, e a tutti li colori. Nota che questo colore con biacca fa color di carne bellissimo.

La residenza della gomma lacca bisogna lavarla nella liscia, sin tanto ch' habbi lasciato il color rosso, e vi servirà per fon-

ing with the other colours, as cinnabar, orpiment, and others, because the gum being passed through the ley, is clarified [or bleached], and all the impurities of the inside will pass off with the colour.

The wood should be covered with a coat of yellow made with orpiment, and the colours placed on it, ad libitum. But this must be after having spread the yellow with a willow wand or some other stick.

91. *To purify the gum lac, so that it will give a lustre like crystal.*—Take the clearest gum, break it in a strong and clear cloth bag, 2 fingers in breadth, and at the two extremities of the bag tie two sticks, so that they may keep the bag closed, which you will present to the fire, and continue turning it round until the gum passes through the cloth, which you must scrape with a wet knife, on the marble, and continue to do so until the whole has passed through, taking care that you do not burn yourself, and this gum, thus purified, serves for giving a lustre to all works.

92. *An amber varnish.*—Take common turpentine, make it to boil for a quarter of an hour, add to it some amber well powdered on the marble, boil it for half an hour until the amber is liquefied, and take it from the fire. As soon as it is cold it will become hard; when you wish to use it, dilute it with oil of turpentine in order that it may liquefy, and it will be better to heat it slightly that it may be more manageable, taking notice that while it is hot, it should be passed through a cloth, and the part which passes through will be the best part. Apply it with the pencil or with the warm hand. It is necessary to acquaint you that this composition should be washed in hot water, after it has been well strained, that it may be clean and pure.

93. *Another secret to make the true Indian varnish.*—Take gum lac and oil of spike, both of them clean and pure. The oil must be cleansed from its impurities with an equal quantity of litharge of gold; it must then be redistilled and again left to settle until it becomes clear after being passed twice

dere con li colori, come cinaprio, orpimento, et altri, perchè la gomma essendo passata per la liscia si renderà chiara, e tutte le sporchezze di dentro se ne anderanno alla tintura.

Bisogna coprire il legno di giallo fatto con l'orpimento e di poi mettergli li altri colori ad libitum sopra, ma questo dopo haver bene disteso il detto colore giallo con un bastone di salice o altro.

Per purificare la gomma lacca che darà il lustro come cristallo.—Prendi la gomma più chiara conquassala dentro un sachetto di tella forte e chiara, che sii stretto due dita, et alle due estremità del sacco, lega due bastoni che tengano serato il sacco, qual presenterai al fuoco, voltandolo sempre sino che la gomma passi fuori della tella, qual raschierai con cortello bagnato sopra il marmo, e seguirai sino che è passata, ma avverti di non abbruciarla, e questa gomma così purificata serve per lustrare tutti li lavori.

Vernice d'ambra.—Piglia grassa terbentina, fala bollire per $\frac{1}{4}$ d' hora, e ponili del ambra sul marmo ben in polvere fata, e falla bollire per mez' hora sin che l' ambra sia liquefata, levala dal fuoco, e subito fredda, diverà dura, volendola adoperare bisogna aiutarla con l' oglio di terbentina, acciò si liquefaccia, e fala un poco scaldare per maneggiarla bene, avvertendo che quando e calda di farla passare per un panno et quello che passerà sarà il buono, applicandolo con pennello overo con la mano ben calda. Bisogna avvertire che tutta questa compositione, si deve lavare nel acqua calda dopo d' haverla ben colata acciò sii ben netta e purgata.

Altro secreto per fare la vernice vera d' India.—R. Gomma lacca, et oglio di spiga tutti neti e puri, l' oglio bisogna che sia netatto dalla sua grossezza con tanto di letargirio d' oro, quanto di oglio, e questo bisogna far passare per un vetro per distillatione, e si torna a riposare, sino che sia ridotto chiaro, e pas-

through the still. Another vessel shaped like this must be procured, and for every 4 ounces of spike must be taken one ounce of gum lac (if it is very yellow and clear there is no doubt of its goodness); the whole is then to be placed over a charcoal fire and to be boiled until the colour is changed, and the varnish becomes like honey. To know whether it is good, put a drop on a knife, and if it remains united it is good; it must afterwards be poured through a linen cloth into a vase of majolica and preserved.



Cinnabar is ground up with pure water, and dried on the stone; then ground for a quarter of an hour with seven times its quantity of varnish. The varnish is then applied with a pencil, and the work is to be exposed to the air for 2 hours in order that the odour may pass away; for the same reason the work is to be kept in a warm place; any colour may then be laid on 5 or 6 times.

After this it must be made perfectly clean and again varnished, continually dipping the pencil in oil of spike. Whenever you varnish you must dry the whole perfectly.

In using the yellow colour you must wait some time for the dissolution of the gum, or you must dissolve it over a slow fire if you do not wish to wait long.

94. *A very clear varnish for pictures and paper alla Fiaminga.*—Take 7 ounces of highly rectified spirit of wine, 2 oz. of sandarac, and 2 ounces of olio d'abezzo. The sandarac, which should be very clear, must be pulverized and put in a bottle with the olio d'abezzo, which also must be very clear. The spirit of wine must then be added, and the whole boiled gently over the fire, until the whole is dissolved, keeping the mouth of the vessel well closed, that the spirit of wine may not evaporate. The varnish must then be strained into a glass vase, leaving the impurities at the bottom. When it is used it must be put into a majolica cup, the picture also must be heated, and the varnish applied with the pencil.

sato due volte si piglia un'altra bozza come qui e per ogni quattr' oncie di spiga, si piglia un' oncia di gomma lacca, e come sarà ben giallo, e chiaro, non si dubiti della sua bontà, questa tutt' insieme si mette sopra foco di carboni, e si fa tanto bollire sin che si muta il colore, e diventi come mele, per conoscer questo s' è buono, si mette una goccia sopra un cortello, e restando tutto unito, e buono, e poi s'infonde per panno lino in vaso di Majolica e si conserva.



Il cinabrio si macina con acqua pura, e si fa seccare nella pietra, poi si piglia sette volte più di vernice che di colore, si macina ben bene insieme per un quarto d' hora, poi si piglia un pennello, e si mette alla robba, poi si fa stare all' aria due hore acciò passi l' odore, e si tiene la robba a loco caldo acciò più presto passi l' odore, e porre il color che piace 5. o 6 volte.

Poi si netta polito, poi si piglia la vernice, e si dá sopra il lavoro un' altra volta, con bagnare il pennello nel oglio di spiga sempre. Ogni volta che darai la vernice lascerai ben asciugare il tutto.

Il color giallo l' hai d' attendere per disoluzione della gomma, overo la farai a fuoco lento, se non voi aspettar tanto.

Vernice lucidissima per pitture e carte alla fiamenga.—R. oz. 7. acquevita sfematt^{ma} oz. due Sandaraca, oz. due abiezzo. La sandaracca sia ben chiara si polverizzi, e si meti in bozza insieme con l' abiezzo, che deve essere chiarissimo, et poi ponivi l' acquevite, e falla bollire dolcem^{te} al foco sino che tutto di venti acqua tenendo stopata la bozza acciò l' acqua vite non svapori, e poi si coli in vaso di vetro facendo restar a dietro il fondo, e quando si vol adoperare si mette in tazzine di Majolica, e si fa scaldare anco il quadro, e con pennello si và seguentemente dandola vernice.

95. *Mode of engraving and painting on glass.*¹—The engraving you wish to transfer must be soaked in water for the space of 24 hours or more, according to the size of the paper.

Then take a glass cup containing an ounce ^{richmen} of turpentine, and place it to boil over a slow fire for half a quarter of an hour; add to it a drachm of powdered mastic, and let it again boil for half a quarter of an hour. Take the glass [to which the print is to be transferred], heat it well on one side only, then lay the print on a cloth in order to absorb the superfluous moisture, and lay the glass on it, which should not be very hot; then turn it over and remove the air-bubbles with the fingers and also the paper, so that it may come off without force. When it is dry, take a wet rag, and rub until the design begins to clear; then, when it is dry, heat it a little by the fire on the side opposite the print, let it cool, and again rub off the paper with the wet rag, and, when it is dry, heat it by the fire more strongly than before, in order that the varnish may soak into the print and make one body, and the work will be clear and beautiful.

96. *Mode of gilding and painting on glass.*—First grind the colours with boiled oil, that is, oil prepared in this manner. Take half a pound of litharge of gold and one pound of nut oil; grind the litharge and put the whole into a varnished pipkin, and boil the oil until it is reduced to two-thirds of its previous quantity. Preserve it for painting on glass.

To make the mordant for gilding on glass, take equal quantities of white lead, terra gialla, and minium; grind the whole together with nut oil, and mix what is ground in a shell or vase with oil boiled as above, boil the whole together a little, and then use it.

97. *To make most perfect water of "grana."*—Take good white wine, put it into a glazed pipkin, and add to it an ounce of verzino, and a drachm of grana; boil it down to half of its original quantity, then add to it three quarters of an ounce of

¹ This should rather be entitled, "Mode of transferring an engraving on to glass."

Modo di stampare e dipingere in vetro.—L'immagine che vorai fare la porai in acqua comune per spacio di 24 hore o più secondo la grossezza della carta.

Poi piglia tazza di vetro con un oncia di termentina e ponila a bollire a foco lento per mezo quarto d' hora, poi vi ponerai una dramma di mastice pistato e lascia bollire un altro mezo quarto d' hora, piglia poi il vetro, e scaldalo bene da una parte sola, habbi poi l' immagine preparata sopra una pezza, ma che non v' abbondi acqua per di sopra, e applica d^{to} vetro non troppo caldo sopra, e poi rivolterai, e anderai con le dita levando le vesighe, e parimente la carta che senza forza se ne viene, quando sarà secca piglia pezza bagnata e v' fregando per insino comincia a schiarire il disegno, poi quando sia secca scaldala un poco al foco da quella parte dove non v' è materia, e poi lasciala raffreddare, e torna di nuovo con la d^{ta} pezza bagnata a levar la carta, poi secca che sia, scaldala al foco più forte che prima acciò l' arteria insupi nella materia e facci un corpo, e venirà chiara e bella.

Modo d' indorare e dipingere sopra vetro.—Prima macina i colori con oglio coto, cioè fato in questo modo. Piglia meza lib. di litargirio d' oro, et una lib. d' oglio di noce, e pesta bene il litargirio, e meta il tutto dentro un pignatino verniciato, e fallo bollire sino che cali il terzo. Serve per dipingere in vetro.

Per indorare in vetro, piglia per fare il mordente, Biacca, terra giala, minio, tanto dell' uno come del altro, macina il tutto insieme con oglio di noce, e poi metti il macinato in conchiglia o vaso con oglio cotto come sopra, e fallo bollire un poco e poi adoprako.

A far acqua di grana perfett^{ma}.—R. Vino bianco bono e metilo in pignata invitriata et poneli oz. una di verzino, et una drama di grana, et falla bollire tanto che calli per metà, et quanto sarà calata metili tre quarti d' oncia d' alume

roche alum, and a quarter of an ounce of "alume di piuma," that is, "flower of stone." Put these ingredients over the fire, mix well till they are all dissolved and until all the gums [i. e. the two kinds of alum] are well incorporated (they should be previously well pulverized), then strain through a fine linen cloth which should be previously wetted with white wine in order that the cloth may not absorb too much of the water, but take care to press out the wine before you strain it.

98. *To make fine lake.*—Take lime water in which brazil wood has been infused, and add to it flour, so that it may become thick, and when the whole is well mixed, let the flour sink to the bottom, make it into a small loaf, dry it in an oven not too hot, then grind it up, and with lime water make it into pellets, and let them dry in the shade.

99. *Varnish for gold.*—Fine sugar lb. 1, gum lac oz. 1, and socotrine aloes dr. 2 ; pulverize each separately, then take of oil of turpentine oz. 8, and distemper the whole, strain through a coarse sieve ; it is to be used cold.

100. *To make crimson from the "solatro Indiana."*—The ripe "solatro" being bruised, must be boiled with any quantity of water, gum arabic, and roche alum, over a slow fire, until the water is reduced to two-thirds ; it must then be left to clear, and the sediment must be dried in the shade, and then ground.

101. *Yellow.*—Socotrine aloes distempored with clear water. Dry buckthorn berries, pounded finely with pulverized saffron, are boiled with alum water until the water is reduced to two-thirds ; it is then strained and dried in the sun. The quantities may be varied at pleasure.

102. *To make the finest Indian varnish.* — Take oz. 8 of gum lac, oz. 4 of the white resin of Arabia,¹ oz. 3 of mastic, and oz. $\frac{1}{2}$ of borax ; liquefy the whole in a glazed basin. When dissolved, strain them through a silk cloth ; then take an ounce and a half of the composition, reduce it to powder, put the powder into a receiver, and throw on to it half a pound of spirit of

¹ Is not this white resin of Arabia, Oriental Copal ?

di rocca, et un quarto d' alume di piuma, cioè fior di piera e questa cosa fa che sia posta al fuoco, e mescola bene tanto che si dissolva, e fa che siano ben incorporati insieme tutte le d^{te} gomme, e fa che siano perfettamente polverizzate, e poi cola per pezza di lino sottile e bagnala prima con vino bianco, acciò la pezza non ricevi troppo di quell' acqua, con struccarla però prima bene dal vino.

Per far lacca fina.—R. acqua di calcina nella quale vi sii stato infuso del brasile, et in essa poni fior di farina, tanto che s' inspessisca, e meschiata bene ogni cosa si lascia poi andar la farina al fondo, della quale fatto un pastoncello si ponga à sec-care nel forno non molto caldo, tritalo poi e con acqua di cal-cina formane ballottine, e lasciale seccare all' ombra.

Vernice da oro.—Zucchero fino lib. j., goma lacca oz. j., aloe sucotrino dramme 2. si polverizi il tutto separatamente, poi piglia oglio di trementina oz. 8. si stemperi il tutto insieme poi si coli per sedaccio si pone in opera fredda.

Far cremesi di solatro Indiano.—Ammaccato il solatro ma-turo senza groppo, si fa bollire con acqua e gomma arabica, et allume di rocca, il tutto a discrezione a fuoco lento sino al calo di due terzi, dipoi si lasci schiarire, e la feccia si lasci seccare all' ombra e poi si macina.

Gialo.—Aloe sucotrino si stempera con acqua chiara. Spin-cervino secco pesto minutamente con zafferano polverizzato si fa bollire con acqua alumata tanto che cali due terzi poi si cola e si secca al sole il tutto a discrezione.

Modo di far la vernice all' Indiana finiss^{ma}.—R. oz. 8. di gom-ma lacca, oz. 4 di raggia bianca d' Arabia, oz. 3 mastice, oz. $\frac{1}{2}$ bo-pace, il tutto fa liquefare in catino invetriato, distrutto si cola per tella di seta poi piglierai un oz. e mezza di d^{ta} compositione, la ridurai in polvere, la qual polvere metterai in recipiente, e le porai sopra meza lib. d' acqua vite rafinata quattro volte, e

wine rectified 4 times, and put the receiver into hot ashes or a sand bath until the powder is entirely dissolved. The varnish will then be finished. It is then used in the following manner :—Add to it a 6th part, by weight, of Spanish red,¹ and with this give 7 or 8 coats to the wood which you wish to varnish, leaving each coat 5 or 6 hours before the next is laid on. After it is quite dry, it must be polished with a small brush and olive oil ; then two coats of varnish must be applied, and when it is dry it must be rubbed very softly with goatskin and with Tripoli powder and oil, when it will be done ; but I warn you that you must follow the recipe exactly.

103. *Another Chinese varnish.*—Take of white carabe [amber] oz. 2, of gum lac oz. $\frac{1}{2}$, of sandarac oz. $\frac{1}{2}$, and of rectified spirit of wine lib. 1. The gums must all be pounded, and put into a long-necked bottle, and left in infusion for 2 days, in order that they may be perfectly dissolved, keeping the bottle well closed. The bottle must then be put in a very gentle sand-bath for 7 or 8 hours, and left to cool, when it will be done.

104. *Clear varnish.*—Take lib. 1 of spirit of wine, oz. 4 of fine turpentine, a quarter of an ounce of white mastic, and the same quantity of sandarac. Put the whole into a bottle, as in the preceding recipe, and in the same manner place it for 6 hours in a sand-bath of such a heat that the varnish will boil. It will then be finished.

105. *Lustro di rasa.*—Lustro di rasa, for grinding bright colours [for painting] on glass, is made with equal parts of spirit of turpentine and Greek pitch, placed over a moderate fire until the pitch is melted.

106. *Varnish is made as follows.*—Take one ounce of juniper gum [sandarac], oz. $\frac{1}{2}$ of pure and clear oglio d'abezzo, which is called oglio d'abiezzo for making varnish, oz. $\frac{1}{2}$ of the best 7 times rectified spirit of wine. The sandarac must be ground up, and made into a paste with the abezzo. It must then be put into a bottle, the spirit of wine must be added, and

¹ The Almagre of the Spanish writers. A pigment is still sold at Venice

porrai il recipiente a fuoco d' arena o cenere sin tanto che la detta polvere sia tutta distrutta, e così la vernice sarà fatta. Si adopera poi come sotto, mettendovi dentro la sesta parte del peso, di rosso di spagna quanto sarà il peso della vernice, e doppo con un pennello dare sette o otto mani sopra il legno che si vorà accomodare, faccendo distanza de una mano all' altra cinque o sei hore, e doppo che serà ben secca bisogna pulire le dete opere con del settolino con oglio d' oliva, e poi applicarvi due mani di vernice, e secco che sarà, lo stropicierai pian piano con la camozza, e del tripoli in polvere con oglio, e sarà fata. Ma avverti che bisogna stare a quello è scritto.

Altra vernice alla China.—Carabe bianco oz. 2. gomma lacca oz. $\frac{1}{2}$, sandaracca oz. $\frac{1}{2}$, spirito di vino disflemato lib. j. si pestano tutte le gomme, e poi si mette in boccia dal colo longo, e vi si lasci in infusione per due giorni acciò si disolvi le sod^{te} gomme tenendo benissimo turato la boccia, e poi si mete a fuoco di sabia gradatiss^{mo} per sette o otto hore, e poi si lascia raffreddare e così sarà fatta.

Vernice chiara.—Lib. una spirito di vino, oz. 4 trementina fina, un quarto d' oncia di mastice bianco, et un quarto di sandracca, il tutto messo in boccia come l' altra vernice, e le si da fuoco per sei hore però di sabia tantochè si vede a bollire, e poi è fatta.

Lustro di rasa.—Il lustro di rasa si fa per macinar colori vivi in vetro con parti uguali d' acqua di raggia, e pecce greca sopra foco moderato sino si liquefaci la pecce greca.

La vernice si fa come sotto.—Oz. una gomma di ginepro, oz. $\frac{1}{2}$ oglio d' abezzo puro e chiaro, quale si addimanda oglio d' abbiezzo per far vernice oz $\frac{1}{2}$ acqua vite boniss^{ma} di sette cotte. Si macina la sandaracca e si fa pasta con l' abiezzo e si mette in bozza, e se li mette sopra la d^{ta} acquavite e si mette sopra fuoco dolce, tanto che il tutto s' incorpori, fatto questo

by the name of Terra Rossa di Spagna, but it is believed to be identical with the Terra Rossa d'Inghilterra, and to be actually brought from England.

it must be placed over a slow fire until it is well incorporated. When this is done, the wood or glass which is to be varnished is painted with a tuft of feathers.

107. *A varnish for miniatures and picture frames.*—Take of spirit of turpentine lib. 1, of benzoin oz. 4, and of mastic oz. 2. Reduce the mastic to a very fine powder, and mix it with the benzoin in a varnished pipkin. Then put the spirit of turpentine into a bottle, which you must heat by means of a water-bath, and then mix it with the benzoin and mastic in the pipkin; afterwards incorporating it with the other things over a slow fire, &c.

When this varnish is used on picture frames, you must add to it two ounces of sandarac also well pounded, and you must mix with the varnish the colour which you wish to apply on the frames.

108. *To make very pure white lead.*—Take the calcined lead of the potters, or litharge of gold or silver in proper quantity; pound it finely, pass it through a coarse sieve of silk, and having placed it in an earthen vessel with very strong white vinegar (if distilled it will be better), leave it for 3 or 4 days, frequently stirring it, and letting the impurities of the lead go to the bottom. Then decant the vinegar, and pour over the lees fresh vinegar in such quantity that no odour may proceed from it and that the precipitate may be almost black. Then take rain or well water with the proper quantity of salt, and with this salt water precipitate the lead which is in solution, and wash it with common water until it has no more odour or savour; then dry it, by placing it on leaves of blotting paper until it is dry.

109. *To make a colour like carmine.*—Take powdered cochineal, put it into a ley, and add to it some finely pulverized crystallized arsenic, which is proper for precipitating the colour; it will then turn out well.

110. *Colours for miniature painting.*

White lead,

Burnt yellow [earth],

Paris carmine,

Burnt lake,

con pennello di piuma si pinge il legno, o vetro se vole invernigare.

Vernice per miniature e cornici.—Acqua rasa lib. una, bigione oz. 4, mastice oz. 2, pestasi il mastice in sotill^{ma} polvere, e si mescola col bigione dentro una pignata vernicata, l'acqua rasa si mette in una boccia di vetro, qual si farà scaldare al bagno maria e dappoi la mescolerai col bigione, e mastice nella pignata, facendola poi incorporare con le altre cose a fuoco lento, etc.

Per mettere sopra le cornici vi metterai due oncie di sandaracca anche ben pista, et il colore che vi vorai mettere, lo macinerai con la vernice.

Per far biacca purgatiss^{ma}.—Si piglia piombo calcinato da boccallari o litargirio d'oro o d'argento, la quantità che si vuole, si pesti sottile, poi si passi per settaccio di seta, e posto questo con aceto fortissimo bianco, e se fosse distillato sarebbe migliore, si lasci in un vaso di terra tre o quattro giorni mescolandolo spesso, lasciando andare al fondo la terestreita del piombo, di poi si decanti, e sopra le residenze si ponga novo aceto sin tanto che non dia più sapore facendosi la terra quasi nera. Si prende poi acqua pluviale, o di pozzo con del sale alla quantità che si vole et poi con d^{ta} acqua salata si precipiti il piombo soluto, poi si lavi con acqua commune sin a tanto che non habbi più odore ne sapore, e poi s'asciughi, e si ponghi sopra foglii di carta strazza sin tanto sij secca.

Per fare un colore com'è il carmino.—Piglia casoniglia pista, e si mete in liscia, e se li mette arsenico cristallino ben polverizzato, che questo è atto a precipitare il colore, e si cava beniss^{mo}.

Colori per miniare.

Bianco di piombo,
Carmino di Parigi,

Giallo bruggiato,
Lacca bruggiata,

Dutch vermilion,	Brown from burnt terre verte,
Rosso delle aguze,	Burnt umber,
Red from Roman vitriol,	Indian black [ink ?],
Red from rust of iron,	Black from burnt acorns,
Terra d' Inghilterra,	Ultramarine,
Stone yellow, ¹	Lily green,
Flanders yellow,	Indico.

111. *Secret preparation of the scammony.*—Take out what you consider a proper quantity of clean scammony, liquefy it by means of a gentle heat with strong spirit of wine, with which a little salt of tartar has previously been dis-tempered, and afterwards filter the solution; then evaporate one-half of it in a water bath, and when it becomes tolerably cool, add to it as much rose water as is sufficient to make the very pure resin of the scammony fall to the bottom of the vase, which should be of glass, free from all ungrateful savour, odour, and malignity. Then pour off the water, dry the powder, and keep it for use. The dose is half or even a scruple in some convenient vehicles, &c.

112. *Lily green.*—Take the juice of the flowers of purple lilies, but the juice of the buds will be better, and having purified two glasses full of it, add a piece of lime of the size of a small pea, and the same quantity of unburnt roche alum with a little pulverized candied sugar; and when they are well dissolved and incorporated, the colour must be dried by exposure to the air.

113. *To make very fine lake.*²—Take oz. $\frac{1}{2}$ of lac, half drachm of crystals of tartar pulverized, and a scudella of hot water. First dissolve the tartar, then take the lac which has been ground, put it on a clean linen rag, and tie it into the form of a ball, and then cut off the superfluous part of the rag, and put the ball into the above-mentioned hot water, placing the scudella over some hot cinders, and leaving it there until the

¹ Probably native yellow ochre. The best kinds are sold in the lump, and not in powder.

² In the original MS., this recipe is broken into two parts by a repetition

Minio d' olanda,	Biondo di terra verde bruggiata,
Rosso delle aguze,	Terra d'ombra bruggiata,
Rosso di vitriolo Romano,	Nero d' India,
Rosso di rugine di ferro,	Nero de' giande brugiato,
Terra d' Inghilterra,	Oltramarino,
Giallo di pietra,	Verde gilio,
Giallo di Fiandra,	Indico.

Preparazione segreta della scamonea.—Piglia quella quantità che voi di scamonea netta, liquefatta à dolce caldo con acqua vite gagliarda, dove prima sia stato distemperato un poco di sal tartaro a discrezione, poi stemperata feltra la solutione, poi in bagno maria fa sfumare la metà, poi rafredato alquanto il d^{co} liquore metivi dentro tanto d' acqua rosa quanto basti per far cadere nel fondo del vaso, che vol essere di vetro, la resina puriss^{ma} della scamonea libera à fatto da qual si voglia ingrato sapore, odore e malignità. Poi leva l' acqua, secca la polvere e conservela per i bisogni. La dose e mezzo, o pure un scrupolo in vehicoli convenienti, etc.

Per fare verde gilio.—Si cavi il succo da fiori di gilij pavonazzi, da bottoni sarà migliore, e purgato nella quantità di due bichieri, si mette quanto un cece di fior di calcina, e un altro d' alume di rocca non abruggiato con un poco di zucchero candido spolverizzato, il che disfatto che sia, e ben incorporato, si sciuga all' aria.

Per far lacca finiss^{ma}.—Si piglia lacca mez' oncia, cristallo di tartaro in polvere meza dramma, et una scudella d' acqua calda, si pone prima il cristallo, e si fa dissolvere, poi si piglia la lacca macinata e si pone in un pezzetto di lino pulito, e si trenghe in forma di balla poi si.

Per far lacca finiss^{ma}.—Osserva li due segni neri. || Si piglia lacca, mez' oncia ; di cristallo Tartaro in polvere meza ; ||

of the title and the first line ; as this was evidently a mistake, I have avoided it in the translation.

water becomes well coloured. When this is the case, take the ball from the water, and evaporate the water gently over the hot cinders until the colour is condensed at the bottom ; it will then be done.

115. *To make a most beautiful purple lake.*—Take an ounce of fine grana or cochineal, a quarter of an ounce of roche alum, and about a bocale full of common water. Boil the water with a quarter of an ounce of fennel seed until it is diminished one-third ; then add the grana or cochineal finely pulverized, and boil the whole over a slow fire for a quarter of an hour ; then add the pulverized roche alum, and let it boil for another quarter of an hour. After this take it from the fire, strain it through a linen cloth into a new and unglazed earthen porringer, and leave it there for 8 days. You must then decant the water, or take it up gently with a sponge, evaporating the little which remains until the colour is condensed, which you must afterwards keep in shells, adding to it a little lemon-juice.

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, when the clear ley will pass through, leaving the coagulum on the cloth, which coagulum must afterwards be dried and made into tablets.

117. *To make a red Parisino [Parisian] colour.*—Take oz. $\frac{1}{4}$ of Brazil wood, and half a bocale of clear ley ; put the ley into a new glazed pipkin, and when it is hot, add to it the Brazil wood, keeping it over a slow fire for a quarter of an hour. It must then be strained through cloth into a new pipkin, and some pulverized roche alum of the size of a grain of rice must be added to it, and the mixture must be stirred without heat for 7 or 8 minutes. The whole must then be put

taglia il superfluo di d^{ta} pezzetta, si mette la detta balla nella soprascritta acqua calda, applicando la scudella ad un poco di cenere calda, et ivi si lascia sino che l' acqua sij ben colorita, all' hora si leva la balla dall' acqua, e si fa svaporare l' acqua pian piano sopra la cenere calda sin à tanto che il colore si condensa nel fondo, e sarà fatta.

Per fare una lacca pavonazza belliss^{ma}.—Si piglia un' oncia di grana fina, o cocciniglia, allume di Rocca un quarto d' oncia, acqua commune circa un bocale, si fa bollire la detta acqua con un quarto d' oncia di seme di finocchio, sino alla diminutione d' un terzo, poi nella d^{ta} acqua si aggiunge la d^{ta} grana, o cocciniglia macinata bene, e si fa bollire a fuoco lento per un quarto d' ora, poi vi si aggiunge l' allume di rocca fatto in polvere, e si lascia bollire per un altro quarto d' hora, ciò fatto si leva dal fuoco, si cola per pano lino in scudella nova di terra non vitriata, e si lascia per otto giorni, qual poi si decanta o si leva gentil^{te} con spugna facendo evaporare quel poco che resterà sin tanto che il colore si condensa, quale si conserva nelle conchiglie applicandovi un poco di succo di limone.

Un altra sorte di lacca fina.—R. Piglia 12 grani di cocciniglia, o grana fina fatta in polvere, si pone in due oncie di lissivio lasciandola in infusione 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.

Per far color rosso Parisino.—La quarta parte d' un' oncia di legno di Brasile, mezo boccale di lissivo chiaro, si pone il liscivo in pignata nova invitriata, scaldato che sij, vi si aggiunge il d^{to} legno tenendolo a foco lento per un quarto d' hora, dopo si cola per pezza in pignata nova, e vi si agionge quanto una rizzolla d' allume di rocca in polvere, e si mena senza foco per mezo quarto d' ora poi si pone il tutto in un sacco acuminato, e si

into a pointed bag and passed through twice, as in straining wine. It may be kept in shells, &c.

118. *To make rose colour.*—Take the above-mentioned colour, heat it over the fire, and when quite hot add to it a little fish-bone (that is, sepia) in powder, but in very small quantity, that the colour may not be too dry; then stir the whole well in the sun until it is cool. It may be kept without adding gum, but must be distempered with parchment glue.

119. *To prepare minium.*—Take the minium, steep it in water, beat it up well; then decant the finest part, and let it dry. It is to be incorporated with parchment size and a little purified honey.

120. *To make violet colour.*—Take bastard madder,¹ grind very finely a small quantity of it, and put it in hot [liquid] “color di verzino,” but take care there is no roche alum in it, which precaution you ought also to observe with the rose colour.

121. *Straw colour.*—Take lead yellow [massicot], wash it with a very strong and clean ley, then decant the ley, and distemper the colour with parchment glue.

122. *A most beautiful white.*—Take some powdered Venice crystal [glass], add to it a third part of powdered sulphur, place it in a well-luted pipkin over lighted charcoal, and leave it there until the pipkin becomes well heated and red hot; then take it off; and when it is cold break it, and collect the pigment which is in it, grind it and preserve it.

123. *Another violet colour.*—Incorporate 2 parts of the above-mentioned rose colour with 1 part of turchino or turnsole, and it is done.

124. *A most beautiful black.*—Burn the books of gold-leaf, leaf by leaf separately; let the ashes fall into clean water, then take them and incorporate with parchment glue. The colour will be most beautiful.

125. *A most beautiful blue.*—Take “smaltino,” pass it

¹ Galium Mollugo, Galium Album. The great ladies' bed straw, or wild Bastard Madder.

passa due volte come il vino colato, e si conserva in conchiglie &c.

Per far color di rosa.—Si piglia il color soprad^{to}, si pone al foco acciò si scaldi bene scaldato vi si giunge un poco d' osso di pesce in polvere cioè di seppa, ma pochiss^{ma} quantità acciò il colore non riesca troppo secco, si move il tutto bene al sole sin tanto che sij raffreddato, e si conserva senza porvi gomma, ma si stempera con cola di pergamena.

Per preparare il minio.—Si piglia il minio posto nel acqua, si sbatte benissimo; poi si decanta la parte più sottile, e si lascia asciugare; s' incorpora con acqua pergamena liquida con poco miele purificato.

Per far color di viole.—Pietra [piglia?] Galica bianca, si macina ben sottile in poca quantità, e si pone in color di ver-zino caldo, ma che non vi sii alume di rocca, il che si deve avvertire nel color di rose ancora.

Gialdo di Paglia.—Piglia gialdo di piombo, si lava con liscivo ben forte e netto, poi si decanta il liscivo, e si stempera il colore con cola pergamena.

Un bianco belliss^{mo}.—Si piglia cristallo di Venetia fatto in polvere, vi si agionge la 3^a parte di solfo in polvere, si pone in pignata tutto ben lutata sopra li carboni accesi, e si lascia sin a tanto che la pignata sij ben infocata, et accesa, poi si rimuove e fredda che sij si spezza, e la materia che vi sarà dentro si macina e serve.

Altro color di viole.—Doi terzi di color di rose soprad^{to} s' incorpora con un terzo di color turchino, o tornasole ed è fatto.

Un belliss^{mo} nero.—Li libri del oro in foglio abbrucciati a foglio per foglio al lume, e far cascare l' abbrucciato nel acqua netta, piglia poi quella robba incorporala con colla pergamena ed è belliss^{mo} &c.

Un Turchino belliss^{mo}.—Si piglia smaltino passa per settaccio sottile, incorpora con biacca e gomma macinata.

through a fine sieve, incorporate it with white lead, and grind it with gum.

126. *Mountain green*.—Grind the mountain green with parchment size and “succo verde.”

127. *Sap green*.—Take the berries which grow on the hedges in bunches like grapes, collecting them 24 days before the feast of St. Michael. When they are ripe, place them in a pipkin, and dry them well with pounded alum for 2 days in the sun. Then add to them clear ley, and boil them over a slow fire until reduced two fingers' breadth; then strain the liquor, and pour it into a bladder and expose it to the air that it may dry.

128. *To prepare saffron for painting*.—Take the saffron, tie it up in a rag, and steep it in white vinegar, with a little gum or white of egg beaten and strained; but if you make use of the white of egg, use no gum.

129. *To make gold colour*.—Take orpiment which has been well ground with ox gall, put it into a pipkin with saffron and white wine, and let it boil over a slow fire until it has a body. When you wish to use it distemper it with white wine mixed with the above-mentioned gall.

130. *To make verdigris*.—Take pieces of copper anointed with purified honey, and fasten them to the cover of a well-glazed pipkin, which must be full of hot vinegar made with strong wine; then cover it and place it in a warm situation for 4 or 5 weeks, and when you uncover it, remove the colour which you will find on the pieces of copper, and it will be most beautiful.

131. *To make a colour of dragon's blood*.—Dragon's blood is ground up with sal ammoniac and pounded gum; it will be much better for the addition of white lead and minium. •

132. *Distemping of cinnabar*.—When the cinnabar is well ground, it is to be incorporated with a strong white; it is then dried on the stone, and reground with well-beaten white of egg and a small portion of Hepatic aloes. It may then be preserved, and when used it should be distem-

Verde di montagna.—Si macina il verde di montagna con cola pergamena liquida e succo verde.

Succo verde.—Si pigliano bacche che vengano per le sieppi in forma d'uve, si raccolgono 24 giorni avanti S. Michele quando sono mature, si pongono in pignata, e s'abbruciano bene con alume pestato due giorni al sole in infusione, poi si aggiunge liscivo chiaro, e si pone al foco lento acciò bolli sino al calo di due detta poi si cola e si pone in vescica all'aria acciò secchi.

Accomodar il zaffarano.—Si piglia il zaffarano, si pone in pezzetta legata, si pone in aceto bianco con un poco di gomma, ovvero bianco d'ova ben sbattute e passate, ma senza gomma se adopri il bianco dell'ovo.

Per far color d'oro.—Orpimento ben macinato con fiele di bue si pone in pignata con zaffarano, e vino bianco, e si lascia bollire a foco lento sin tanto che piglij corpo, poi si distempera con vino bianco, quando lo voi adoperare misturato con fiele soprad^a.

A far verde rame.—Piglia pezzette di Rame onte con miele purificato, attaccali al coperchio d'una pignata ben vitriata che sij piena d'aceto caldo di vin forte fata, poi coprila e ponila in loco caldo per quattro o cinque settimane e scoprendola leverai il colore che troverai sopra li detti pecci di rame che sarà belliss^{mo}.

Per far color di sangue di Drago.—Sangue di drago si macina con salmiaco, e gomma pista riuscirà più bello con agiongervi un poco di biacca e minio.

Tempra del Cinaprio.—S'incorpora il cinaprio con un bianco forte quando sarà ben macinato, poi si lascia seccare sopra la pietra, e si macina di nuovo con chiara d'ovo ben sbatutto, et una picciola parte d'aloë epatico, si conserva, et quando si

pered with spring water and a little white of egg, and it will flow more freely if a little myrrh be added.

133. *To make giallo santo*.¹—Take the berries of the buckthorn towards the end of the month of August, boil them with pure water, until the water is loaded and thick with colour; add a little burnt roche alum and then strain it. You may boil the strained liquor to make the colour deeper, mixing with it some very pure gilder's gesso; then make the colour into pellets, and dry them in the shade.

134. *Secret for making lake*.—To 2 pints of common water add 2 ounces of pulverized soda, and leave the mixture in this state for 24 hours; then strain it, and put into the ley 6 ounces of "pastella;" then leave it again for 24 hours, strain it through [a bag shaped like] a capuchin's hood, add alum water, stir it with a stick, and add water to it in order to remove the salt. When the colour has fallen to the bottom, pour off the water, collect the lake which will be at the bottom, dry it, and it will be finished.

135. *To make a carmine colour*.—Take powdered cochineal, add ley to it, and instead of alum water, add well pulverized crystallized arsenic, for this will precipitate the colour, which will be brighter if treated as above.

136. *To extract the colour from Chinese grapes for painting and miniatures*.—Take the grapes when quite ripe, pound them, pass them through a press, filter through linen rag, and evaporate the juice over hot cinders; when all the moisture is evaporated, take spirits of urine, which you must pour on to the juice, and let it remain until you see that it is well coloured. Then take some spirits of wine, and add them, so that the colour may be precipitated, or evaporate it, and preserve the colour in small bags of parchment or skin.

137. *To make most beautiful sap green*.—Take the berries of the buckthorn when they are quite ripe, which will be about the

¹ In the Nuovo Plico, Giallo Santo is said to be made of the flowers of the Erba Lizza, Barba di Becco (yellow goat's beard). We may, there-

vorà adoperare si piglia acqua di fonte con un poco di chiara d' ovo, e perchè corri meglio aggiungi un poco di mira.

Per far giallo santo.—Piglia grana di spincervino nel fine d' agosto, fallo bollire con acqua pura sin tanto che sij ben carico, e spesso di colore con poco d' alume di rocca non bruggiato, poi si coli quale per farlo per farlo (*sic*) più colorito si può farlo bollire, e con detta colatura s'impasti gesso purgato di quello d' indoratori, e se ne faccino ballotte quali si seccano all' ombra.

Segreto per la lacca.—Piglia due pinte d' acqua comune, e meti dentro due oz. di soda polverizata e lascialo per 24 hore poi si cola, e poi metti nella d^a liscia oz. 6 pastella, e si lascia per 24 hore, poi passala per capuccio, poi metti acqua alumata, poi mescola con bastone et aggiungi acqua per levare la sal-sedine, quando il colore sarà andato al fondo decanta l' acqua poi piglia la lacca che sarà al fondo, falla seccare e sarà fata.

Per far colore di carmino.—Piglia consongliá pesta, meti in liscia, e in cambio d' acqua alumata meti arsenico cristallino ben polverizato che questo precipita il colore e si fa più vivo a fare come sopra.

Per cavare il colore dall' uva della China per dipingere e miniare.—Si piglia la d^a uva ben matura, poi si pesta, e si passa per torchio, poi si feltra per pezza di lino, poi si fa evaporare sopra le ceneri calde, passata tutta l' humidità piglia spirito di vino, si pone nel succo sin che si vede ben colorito, piglia poi spirito d' orina, e si mette acciò precipiti il colore, overo fallo svaporare, e conservalo in sacchetti di carta capretta o pelle.

A far pasta verde belliss^{ma}.—Si piglia la grana di spinsel-vino ben matura, che sarà quando l' uva è matura, si pista, e

fore, safely infer that it was a yellow lake made sometimes with the juice of one plant, and sometimes with that of another.

time when grapes are ripe ; pound and boil them as soon as they are gathered, and add to them a little roche alum ad libitum, and when the liquor becomes of a beautiful green, which will happen in about an hour, take them from the fire, and when cold filter, and keep what passes through in a bladder in the chimnéy that it may dry well.

138. *To make excellent boiled hair.*—Take the manes, forelocks, and tails of oxen, horses, cows, and calves (but remember that the tails of horses are not good), place them in fresh water, and wash them so that there may not remain any grease or dirt ; then string them on a cord, afterwards put them into a vessel with ley and let them boil for 6 hours.

139. *To make super-excellent carmine.*—Take an egg, make a hole in it so that the white will run out, then take mercury and fill the egg with it, stop up the hole and lute it according to the best of your ability ; then bury it two feet deep in horse-dung which is very much exposed to the sun, and do this in the dog days. Leave it in this situation for 40 days, then take it out, with great care, lest it should break ; then break it, and you will find in it a living animal ; let the animal die, and preserve it, it will fall to powder ; use this powder, which will be a most splendid carmine, for painting and miniatures, but you must beware of the smell at the beginning.

140. *To colour canes and to imitate those of India.*—Polish well the cane, then take gum water, and mix with it white lead and smaltino according to your fancy ; this is the composition which you must sprinkle on the cane with a pencil ; then shaking the cane hold it over the fire with sulphur until the cane becomes black. Then polish it with a wet rag, afterwards rub it well with a little olive oil, taking care to do this from knot to knot.

141. *To blacken the wood of the apple, pear, olive, box, service, cherry trees, and elm (?)*.—When the wood has been polished with burnt pumice stone it must be well rubbed with a coarse cloth and with the said powder, bathing the work with German size that it may be more polished ; it must then be cleaned with another rag.

si fa bolire come si trova, e si aggiunge un poco d'alumme di Rocca ad libitum, quando vedrai un verde belliss^{mo}; che verà in spacio d' un hora, si leva dal foco, e fatta fredda falla passare per feltro, e conservala in vesica sotto il camino acciò si secchi bene.

Per fare crino bollito belliss^{mo}.—Si piglia le cume e zuffe, cove di bovi, cavalli, vacche, vitelli, ma avverti che le cove de' cavalli non sono bone. Si pongono in acqua fresca, e si lava acciò non le resti untume ne sozzure alcune, di poi falle fillare in corda poi si pone in parollo (sic) di liscia, e si fa bollire per 6 hore.

Per fare Chermينو sopraeccellentissimo.—Piglia un ovo, fali un buco tanto che n^o eschi la chiara, poi piglia mercurio, et empi l' ovo, e di poi tura bene il bucco, e lutalo secundum artem, e ponilo in Ruto di cavallo sepolto un braccio fondo in loco chevi giochi il sole più sii possibile in tempo di Canicola fallo, e fallo stare quaranta giorni; poi levalo con avvertenza che non si rompi, poi più avvertito rompilo che vi troverai un animale vivo, lascialo poi morire, e serbalo che anderà in polvere, e di quella serviti, che sarà un chermينو non più visto da dipingere et miniare, ma guardati dal tuto alla prima.

Per far Canne tinte e finte d' India.—Polisci bene la canna, poi piglia acqua di gomma, biacca, e smaltino, à tuo modo unissi con d^a gomma, farai la composizione da spruzza su la canna con pennello, e dibattendo la canna la porrai sopra il fuoco con zolfaro sinche la canna venghi nera poi la pollirai con straccio bagnandola con acqua, e poi con un poco d' oglio d' olivo, e la sfregherai bene, avvertendo di far questa fattura a nodo per nodo.

Per far negro Pomo, pero, olivo, Busso, zorbolo, cerasa, verna [e orno?].—Pulito che sarà il legno con pomice bruggiata, si fregghi bene il lavoro con canovazzo, e detta polvere bagnando il lavoro con acqua di cola tedesca acciò venga più pulito poi si neti bene con altra pezza.

142. *A water for blackening the above-mentioned works.*—Boil the rind of the pomegranate in water until a third part is consumed, and lay it all over the work, which must be quite hot, with a pencil of hog's bristles; then let it dry in the shade, and in the same manner give 3 coats, having the water always quite hot, and always leaving it to dry in the shade.

Item, take Campeachy wood (?) which has been boiled in water with a little roche alum until a third part has evaporated, and while it is still hot, give 3 coats of it as above, leaving it to dry in the shade. Item, for putting on the black. The strongest white or red wine, in which you must put a quantity of iron filings at discretion, bearing in mind that the more iron filings you add the blacker will the composition be, and it should be left in infusion for 24 hours; it will thus make a most beautiful black. When the 24 hours are past you may add to it ox gall at discretion, afterwards boiling it until it is reduced one third. You must apply 3 coats of it while hot on the work, allowing each coat to dry in the shade, and the more coats you lay on, the blacker will the work be.

143. *To polish the work.*—Rub it well with new cloth; then take fine Tripoli powder which has been well rasped and pounded finely with goatskin, and rub the work well, so that it will have a lustre; then take white wax, if you wish it to be still brighter, and rub it over the work, which will thus become most beautiful.

144. *To grind lake.*—Spirits of wine or candied sugar, at discretion, with gum water and a few drops of oil of tartar.

145. *Beautiful smaltino.*—Grind it up with spirits of wine; then regrind it with dragon's blood in tears before the spirits have evaporated, and it will be beautiful. It should also be incorporated with burnt Roman vitriol or burnt "pietra focaia,"¹ &c.

146. *To make the Turkish paper waved with divers colours.*—The colours which succeed best on this paper are fine orpi-

¹ See ante, p. 537, n.

Acqua per dare il nero a soprad^{ti} lavori.—Scorze di pomo granato si faccino bollire in acqua che consumi un terzo, poi con pennello di setola si dij sopra il lavoro, che sij ben calda. Doppo coperto tutto il lavoro di detta acqua si lasci sciugare all' ombra, e di quest' acqua sempre calda se ne dij tre mani, e si lasciano sciugare all' ombra sempre.

Item si piglij compuccio a discrezione bollito in acqua comune alla consumatione del terzo con un poco d' alume di rocca, e cosi calda si dij sopra tre mani come sopra, e si lasci sciugare all' ombra. Item per dare il negro. Vin fortiss^{mo} bianco o negro nel quale porrai dentro quella quantità di limatura di ferro a discrezione, avvertendo che quanta più ne sarà verrà sempre più nero, e si deve lasciare in infusione hore ventiquattro, e farà nero belliss^{mo} passate poi le 24 hore, o che il ferro sij consumato vi si pone dentro fiele di bue a discrezione, poi falla bollire all' callo (*sic*) d' un terzo. E la darai sopra il lavoro calda tre mani, e lascia sciugare mano per mano all' ombra e con più mani più nero verrà.

Per lustrare il lavoro.—Sfrega bene il lavoro con canevazzo novo, e poi piglia tripolo fino e ben pesto raspato sottil^e con pelle di camozza si fregghi il lavoro ben bene, che si lustrerà, e piglia cera bianca per darli più lustro, e frega sopra il lavoro che verrà belliss^{mo}.

Per macinar lacca.—Spirito di vino o zucchero candito a discrezione con acqua gommata con qualche goccia d' oglio di tartaro.

Smaltino bello.—Si macini con spirito di vino, e poi rimacinarlo con sangue di drago in lacrima, cosi bagnato e sarà bello, et con rosso di vitriolo romano abbrugiato o pietra focaia brugiata incorporati &c.

Per fare la carta turchesca ondata di diversi colori.—Li colori quali riescono meglio in questa carta sono, orpimento, lacca

ment or common lake, cinnabar, that is dark morello, indico, that is purple, and white lead ; but the eye must be the judge of the mixture and making of the colours.




The colours are to be kept separate, but because the orpiment is rather light coloured, it should be mixed with cinnabar during the grinding, and thus it will be of the colour of gold. The lake should be ground up with cinnabar, which will sink to the bottom, so that it requires to be mixed with lake ; purple, not being found in nature, is made with indico and lake ; green is made with orpiment and indico ; sky-blue with indico and white lead ; and black with ivory calcined in an uncovered crucible, but not too much calcined, as in that case it will become white, and indico is the colour which gives it body. These then alone are the colours which succeed ; they must be well ground up with simple water and moderately liquid, so that they may be collected on the stone and placed in their respective vases. They are to be distempered with spirit made from good and not spoiled wine, afterwards adding to them 5 or 6 drops of the gall of an ox or calf, which makes them spread over the gum water of which we shall speak ; and if you do not think that the colour spreads sufficiently, add a drop or two more, and every time that the colours dry add spirit of wine. When they are ground you must add no more water, but spirit, which has the property of fastening the colours to the papers. We have now spoken of all that pertains to the disposition of the colours, and it remains for us to speak of the method of employing them.

You will take, therefore, a tray of the size of the paper which you wish to paint, with the sides 3 fingers high, and entirely covered with pitch ; you will fill it with water, but you must first put the water into a vase, and for one measure of the water you will add an ounce and a half of gum, or one ounce if it is pure and good, adding a little more water, because the gum will absorb part. Leave it in infusion for 2 days and 2 nights, and then mix and squeeze it with the hand into the vase 2 or 3 times a day in order to perfect the water ; and while

flna, o commune, cinabrio, cioè morello scuro, indico cioè pavonazzo, biaca ovvero bianco di piombo, sij giudice l'occhio nel mischiare i colori e nel farli.





Questi servono separati, ma perchè l'oropimento sia troppo chiaro si mischia col cinabrio nel macinarlo, e così piglia il color d'oro, la lacca si macina col cinabrio, il cinabrio va à fondo da lui si che richiede compagna la lacca, per fare il pavonazzo, non trovandosi naturale si fa con l'indico et lacca, il verde si fa con orpimento et indico, per il celeste si fa con indico et biacca, il nero si fa con l'avoglio in crociolo scoperto calcinato, ma avverti che non stia troppo perchè diviene bianchiss^{me} e l'indico è quello che li da corpo. Questi dunque solamente sono li colori che riescono, quali vanno macinati benissimo, e si macinano con acqua semplice e mezanamente liquidi si che si possano raccogliere sopra la pietra, e posti nelli vasi si stemprano con acqua vite fatta di vin bono e non guasto, di poi vi si pone 5, o 6 gocce di fiel di bue o vitello maschio, che questo fa stendere sopra l'acqua di gomma che si dirà, e se parerà che si stenda poco vi porrai una o due gocce di più, et ogni volta che li colori sciugheranno, aggiungi acqua vite, ne da che sono macinati vi porrai più acqua semplice, ma acqua vita, che ha virtù di far attaccare li colori alla carta, e questo e quanto appartiene alla disposizione de' colori, resta ora che disponiamo il corpo di quelli.

Piglierai adonque una cassetta fatta granda come la carta che voi dipingere, con le sponde alte tre dit atutta impegolata, empirai la cassetta d'acqua, ma prima porrai l'acqua in un vaso e per la misura di detta acqua vi porrai un oz. e meza di gomma, e se la gomma sarà pura e bella basterà un oz. avverti porvi un poco più d'acqua, perchè la gomma sorbisce la sua parte, e lasciala in infusione due giorni, e due noti, e poi la mescolarai e premerai con la mano nel vaso due o tre volte al giorno per perfetionar l'acqua, e nel porla nella cassa falla

pouring it into the tray, make it pass through a strong rag. To know whether the gum is too thick, take a feather and lead it backwards from one side to the other frequently in this manner , first pouring in one or two colours; and if these colours  flow after the feather, it will be perfect; and if, on the contrary, they do not follow the feather, the mixture is too thick, and will require to be mixed with some spring water, which must be stirred by the hand, moving it all over the tray. But this imperfection may also arise from a defect in the colours, for instance, when there are not sufficient ingredients, that is, too little gall or not sufficient spirit of wine; the remedy for this can only be learned by experience. We may also warn you that if there is too much spirit the colour will be too light. For each vase of colour you must have a pencil, and must place one colour after the other, a drop for each colour; but you must not touch the water with the pencil, and by its motion you must make the paint fall at equal distances. The colours being placed according to your fancy, you must conduct the pencil from one side to the other as previously directed, merely touching, however, the surface of the water. You must afterwards make a comb of thin wood as long as the breadth of the tray, in which you will insert hog's bristles in this manner,  and the thicker they are the more delicate will be the waves of colour. With this comb you will pass over the whole tray, taking care to touch only the surface of the water, and you will thus succeed well. If you choose, you may make with the feather, circles, snakes, labyrinths, and similar things.

147. *To cause a rose or carnation to become white.*—Burn sulphur in such a manner that the flower may be exposed to the fumes, and it will become quite white; but take care that the companion, which is on the same branch, may not feel it.

148. *To make fruits grow without kernels.*—Cleave the young plant to the root, take out the pith on both sides; then unite the parts, plaster them with ox-dung, and tie them together. This will succeed admirably.

passare per pezza forte. Per conoscere poi se la gomma è troppo spessa piglia una penna alla rovescia, e guidala da una parte e dall' altra spesso in questo modo  ma prima vi porrai un colore o due, se quelli colori  corrono dietro la penna sarà perfetta, altrimenti sarà troppo spessa e converrà porvi acqua di pozzo e mischiarla con la mano per la cassa, ma avverti che ciò può anche avvenire per difetto de colori, quando non vi sono ingredienti a sufficienza cioè poco fiele, o poc' acqua vite et in ciò l' esperienza vi farà pratico, avverti di più che quando vi sarà tropp' acqua vite, il colore sarà troppo chiaro. Per ciascun vaso di colore haverai un pennello, e vi porrai un color dopo l' altro una goccia per ciascun colore, ma non toccar l' acqua col pennello, ma con il moto di quello farai cader la pittura in egual distanza ; posti li colori a tuo modo, li condurrà con la penna da una parte e dall' altra come ho detto di sopra, toccando però solo la superficie del acqua. Di poi farai un pettine lungo come il traverso di detta cassa, e lo farai d' asse sottile, nella quale v' inserirai delli pelli di porco in questo modo  et quanto saranno più spessi, le  onde saranno più delicate, e con il pettine scorrerai tutta la cassetta, ma avverti di toccar solo la superficie dell' acqua, che così riuscirà bello, e se vorai con la penna vi farai de' circoli, biscie, laberinti, e simili.

Per far una rosa o garofalo che divenghi bianco.—Piglia foco di zolfo e con delicatezza fallo sentire al fiore che riuscirà bianchiss^{mo} ; ma avverti non lo senta il compagno ch' è sopra la rama medema.

Fare che li frutti naschino senza armella.—Schioppa la pianta giovine sino alla radice, e levali l' anima da una parte e dall' altra, poi unisse le parti, e con sterco di bue impiastra, e legale insieme, che riuscirà mirabile.

MODO DA TENER NEL DIPINGER.

BY

GIAN BATISTA VOLPATO.

VOLPATO MANUSCRIPT.

PRELIMINARY OBSERVATIONS.

GIOVANNI BATISTA VOLPATO, the author of the following MS., was a painter, born at Bassano in 1633. He was a pupil of Novelli, who had studied under Tintoretto. He settled at his native place, where, after the ancient school of the Bassani had become extinct, he practised the art, and had several pupils. He left some writings on painting, which were preserved in the select and valuable library of Conte Giuseppe Remondini. From the Remondini family the MSS. passed into the public library at Bassano, where they are now preserved. One of these works, entitled 'La Verità Pittoresca,' is believed to be still unpublished, although it was announced for publication at Vicenza in 1685.

In the preface to this work, says Lanzi, Volpato protests that he had no master, but in a MS. at Castel-franco it is stated that he was a pupil of Novelli. He adds that the work is full of good observations, whence it may be supposed he was well acquainted with the theory of the art. Mr. Eastlake remarks¹ that this MS.

¹ Notes to Goethe on Colours, p. 406.

afterwards formed the groundwork of Verci's 'Notizie intorno alla Vita e alle Opere de' Pittori di Bassano.'

Volpato left also another MS. in his own hand-writing, entitled 'Modo da tener nel Dipingere,' which is now published for the first time in the following pages, and the original of which was kindly lent to me by Sig. Baseggio, the librarian and president of the Athenæum of Bassano, with a permission to copy it if we could, for the hand-writing was so bad as to render this extremely problematical. With some trouble, however, we deciphered the MS., with the exception of six or eight words, of which I took fac-similes.

The MS. appears to have been composed in the latter part of the seventeenth or beginning of the eighteenth century. That it was not written previous to 1670 is certain, because Volpato quotes the work of Padre Lana, which was published in that year, and it was probably later, because he alludes to the practice of Canziani, the Veronese painter, who survived Volpato five or six years, being still living in 1712.¹ The terms also in which Volpato speaks of his recollection of the face of S. Pietro Martire in Titian's celebrated picture, suggest the idea of its having been written by an old man. On these grounds, therefore, I am of opinion that the notices in this MS. respecting painting in oil, are to be considered as applying to paintings of the Venetian school at the conclusion of the seventeenth century.

The MS. purports to be a dialogue between two apprentices of painters, in which the elder explains to

¹ See Orlandi's Abecedario.

the younger, who appears to have just entered the profession, the various technical details in which he is to be employed, such as preparing the grounds of the pictures, grinding the colours, setting the palette, tracing the outline, and other mechanical processes, on which the apprentices¹ were usually employed.

Volpato commences by describing the kind of canvas proper for painting, and observes that smooth canvas requires a thin ground only. He then teaches how to prepare grounds, of which he describes several, and states the advantages and disadvantages of each kind, and particularly the effects of gesso on grounds, which he illustrates by referring to the practice of Bassano. He also shows the advantages arising from making the surfaces of pictures smooth. After speaking of the preparation of grounds for pictures, Volpato treats of the preparation of walls for painting with oil colours.

The next subject discussed is the different methods of transferring the design to the canvas, which is said to be the work of the boy and not of the artist; and then he takes occasion to speak of tracing paper and the method of using it, and of other mechanical contrivances for copying pictures.

Volpato then treats of grinding and preserving the colours, and of cleaning the palette and brushes, of the preparation of boiled oil, by boiling it with litharge, of the different kinds of varnish, of which he mentions three, namely, the "vernice grossa," amber varnish, and mastic varnish. He says that he purchases the two former ready made; the latter he makes himself,

¹ See also the Brussels MS., pp. 771, 772, 782.

and in this part of the dialogue he refers to the works of Armenini da Faenza and Raffaello Borghini, "who," he adds, "teach all things pertaining to our trade, and how to make all kinds of varnish, as well as the proper mode of using them."

Again, in speaking of the method of distempering the colours, of setting the palette, and preparing the sketch for the finishing, he speaks of these works, and says the directions given to him for this purpose by his master, "correspond exactly with those of Armenini, and you may write them out also, for besides this he teaches the whole process." These passages certainly afford a fair presumption, that the method of painting in the Venetian school was on the whole like that described by Armenini and Borghini, modified probably by the peculiar habits and style of every artist.

He then speaks of the choice, preparation, and tests of the goodness of the colours, and of the means of rendering certain colours more drying.

Volpato also alludes to the mode of preparing the sketches. He says, "I wash the sketches, I oil them, I varnish them, and on some of them I lay the white of egg, according to his (the master's) orders;" and it is on this occasion that he refers to the work of Armenini.¹ After describing some other mechanical operations, he mentions the injuries done to pictures by cleaning them, and in particular by copyists, whose bad practices he describes and reprehends in the strongest terms, and he adduces one instance (the S. Pietro Martire of Titian) of the ill effects of applying oil (which he says

¹ See Armenini, *Dei veri Precetti della Pittura*, cap. ix.

is not good on pictures) on the surface of a painting, in order that the copyist might see it more distinctly. "This picture," observes Volpato, "has been oiled so many times by the sacrilegious blockheads who have copied it, that he [the figure of the martyr] is so blackened and spoiled, that there is no telling what sort of face he has, and yet," he adds, "I recollect when he was beautiful, and you may observe the children [the angels in the upper left-hand corner of the picture] which, being above the reach of similar influences, are in excellent condition." This difference, however, is not so perceptible as it was in the time of Volpato, for the Pietro Martire was sent to Paris, where it underwent the operation of cleaning, and of a partial repainting. It is now in the church of S. S. Giovanni e Paulo at Venice.

In the fly-leaf, but in different hand-writing, are the following words :—

Licinio.

Silvio.

<p> D. netar quadri lume di feccia. Il libro delle stampe del Ricci, d. L. ii mi conto' </p>	<p> lire 4. 4. 3. 6. 5 .. 18. </p>
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COPY OF AN AUTOGRAPH MANUSCRIPT
OF
GIAN BATISTA VOLPATO,
ENTITLED
"THE MODE TO BE OBSERVED IN PAINTING."
PRESERVED IN THE PUBLIC LIBRARY AT BASSANO.

F. My Silvius, on what subject shall we converse ?

S. I have been but a few days with Sig. Floriani, therefore I should like you to teach me the mode of preparing canvas, colours, and those things which pertain to the business in which I am engaged, as I have had but little practice in such things.

F. Come, you fool, eat, eat, this is not the time for study ; when you have appeased your appetite I will tell you all.

S. You are right, give me a glass of that wine which you praise as being so exquisite.

F. Here, take it, you will find it most delicate.

S. To the health of our masters.

F. I know you are not a servant, but a friend of your master, because servants, being enemies of their masters, desire that they may have all kinds of misfortunes, and not success ; therefore you do not deserve the name of a servant, but that of a friend.

S. My master's kindness obliges me to act thus.

F. My master is not at all inferior to yours, and I would shed my blood for him ; I will therefore join you in drinking their healths.

S. Truly, the wine is not inferior to the capon, and they both deserve to be consumed in a proper manner.

F. There is no one waiting for us, therefore we can take our time, and when we have finished, I will willingly instruct you,

MODO DA TENER NEL DIPINGER.
COPIA TRATTA DALL' AUTOGRAFO

DI

GIAN BATISTA VOLPATO,

CHE SI CONSERVA NELLA PUBBLICA BIBLIOTECA DI BASSANO.

F. Silvio mio, e che volevi discorrer?

S. Pochi giorni sono che stò con il S. Floriani, e per ciò vorrei che m' insegnasti il modo di preparar telle, colori, e tutto ciò, che fa bisogno per servirlo, perchè ho poco pratica di simil cose.

F. Hò, pazzo, mangia, mangia, che non è tempo questo d' applicatione, che fornito ti farò veder il tutto.

S. Hai ragione. Da mi un bichiere di quel vino che mi celebri così squisito.

F. Eccolo, e sentirai una cosa delicatissima.

S. Alla salute de' nostri patroni.

F. Conosco bene che non sei servo, ma amico del padrone, perchè li servi essendo nemici de' padroni, le desiderano bensì tutte le disgratie, ma non la salute, e perciò non meriti nome di servo ma d' amico.

S. La sua bontà m' obliga a questo.

F. Veramente, ne anco il mio non è punto inferiore che spandere il sangue per lui, et io istessamente ti rendo in loro salute ragione.

S. Veramente, il vino non è punto inferiore al capone, e meritono l' uno e l' altro esser devorati come si deve.

F. Non vi è alcuno che ci aspetti. Se la potremo prender comoda, che poi volentieri t' insegnerò principiando dal pre-

beginning with the preparation of the canvas, and gradually going through all those things which belong to the art, because such pertain not to painters, but to those who serve them.

S. We have now finished, therefore you may have the table cleared, but leave the wine, which will season our discourse.

F. Drink away, for I have more of it.

S. I will not disobey you.

F. Now I will tell you what you desire to know. First, you must be told that the canvas must be good, strong, smooth, and well made; that it must be prepared with a thin ground, and must be so durable as to last as long as the picture, and it is the duty of him who buys the canvas to ascertain this, for if the canvas is bad it decays in a short time. Smooth canvas requires but little ground for priming, for if the priming be too thick, the colours become black from the abundance of oil which is used, and the repetition of so many primings; wherefore you must take good canvas, stretch it on the frame, and give it a coat of glue made of the parings of very young pigs' skins, that it may be softer, for such glues as parchment glue, being strong and harsh, cause a certain shrinking of the canvas, which has a bad effect, therefore do as I teach you. When this coat is dry, polish it with pumice stone, give it another coat of glue, as before, and let it neither be too weak nor too strong; for if too weak it will not defend the canvas from the oil, and if too strong it will cause the colour to crack; that which is of the proper consistence will be soft like jelly when it is cooled.

S. If the priming were to be laid on with pure oil, without glue, what would be the result?

F. When the canvas has no glue to defend it from the oil, it loses its strength, for the oil dries, so that it becomes like the bark of a tree, and when the canvas is taken off the stretching frame it cracks and splits.

S. In some shops where they prime canvas, I have seen flour paste used: is this improper?

F. Flour paste is very bad, because if it is too stiff it causes

parar tele, e poi di mano in mano di tutte quelle cose che ci appartengono, perchè queste cose non sono da pittori, ma ben da chi li serve.

S. Siamo al fine, puoi sbratar, lasciando il vino, qual servirà per stemprar li nostri discorsi.

F. Bevi pur alegramente, che ne ho dell' altro.

S. Non dubitar che non le mancherò.

F. Hora ti dirò ciò che brami, e prima sarai havertito che le telle sijono buone, forte, liscie, ben lavorate, che con poca materia restino impresse, la bontà serve che tanta dura il quadro, quanta dura la tela, ed è dovere di chi le compra, che come sono cative in breve si consumano; le telle liscie poca materia l' imprime, che come vi è troppa materia anerisse li colori per l' abbondanza de l' olio che vi si pone ed il replicar molte primitive; e però piglia buona tela, e tirata in telaro, gli darai una mano di colla di retagli di nonnate o maschiette per che riesce più dolce, che le colle come di bergamina, essendo forte e crude, fa certe ritiramente nelle tele che fa cativo effetto, e perciò fa come t' insegno: asciuta la lisciarai con la pomice, e li darai un altra mano di cola come prima et osserverai, che non si troppo dolce ne troppo forte, la troppo dolce non difende la tela dall' olio, e la troppo forte fa crepar il colore, e la buona serà tenera come gelo quando è rafredata.

S. Chi dasse la primitura con olio puro senza cola, che sarebbe?

F. Quando la tela non hà la cola, che la difende dall' olio, non può conservar la sua fortezza, che l' olio si disicca in modo che viene come una cortecia d' arbore, che volendosi maneggiare giù del telaro si taglia e si rompe.

S. Ho veduto in certe botteghe ove si imprime tele usar colla di farina, che forse non è buona?

F. La cola di farina è pessima, perchè come è un poco gag-

the colour to crack and scale off, and if it is too weak the damp causes the canvas to decay, and the rats eat it. These persons use it because they prime very bad canvas, which perishes in eight or ten years, and because the flour paste fills up the holes of the canvas.

S. And those who use gesso ?

F. To use gesso, is to tempt fortune, for many old paintings are to be seen spoiled by the gesso, yet many are in good preservation, but this arises from the quality of the glue, which may be either too strong or too weak, but weak glue is best, because the strong absolutely spoils the canvas, whereas with the former very little gesso is required, for I have observed in the works of Bassano, that those pictures which have been primed with but little gesso are in good preservation, while those on which too much gesso has been used scale off; and you may distinguish these from the others by the texture of the canvas, the threads of which are visible, although being painted they are covered with gesso, priming, and colours; while others which have smooth surfaces, from having too much gesso, scale off. Besides the pictures on canvas, we have examples of this in old paintings on wood, which are well preserved in consequence of this practice of using glue. But dust also is very injurious to old pictures, as you will observe in those belonging to the nuns "Riformati," and Capuchins, whose pictures being kept free from the dust, the colours are preserved admirably. In order to avoid this difficulty, I use simple glue, as I have told you, which I lay on twice, using the pumice stone after each coat when dry, that the canvas may become smooth. I afterwards give them the priming ground up with linseed oil. All earths are good for this purpose according to the taste of him who uses them. I use "terra da bocali,"¹ terra rossa, and a little umber

¹ Terra da boccali, called by Baldinucci (Voc. Dis.) Terra di Cava or Terretta. "The earth or clay used in making earthenware for table services, which, being mixed with powdered charcoal, was employed for making grounds, and for painting chiariscuro, and even in the tints, and which was also used, tempered with glue, upon canvases on which triumphal arches, perspectives, and other scenes, were to be painted. It is better adapted for

liarda crepa il colore e si scorza, e se pur è poca, al umido marcisce le tele, e li topi le mangiano, e quelli l' adoperano perchè imprimono tele tristissime, che in otto o dieci anni restano consumate, e perchè la cola di farina ottura li buchi della tela, si servono di questa.

S. Quelli poi che adoperano il gesso ?

F. Con il gesso si gioca di fortuna, perchè si vede assai pitture antiche sconcerti per il gesso, e molte ancora si conservono, il che proviene dalla qualità della cola, o troppo forte, o troppo dolce, ma la meglio è la dolce, che la forte sciupa assolutamente, et in questo modo ci vol pochissimo gesso, che ho osservato nell' opere del Bassano, che quelle che hano poco gesso si conservano, e quelle che ne ha troppo si scorzano, e ciò si conosce dala tessitura dela tela che si scopre li relevi di detta, ben chè habia gesso, primitura, e colori, essendo dipinte, e quelle liscie che hano assai gesso si scorzano, et oltre le telle si vede l'esempio nelle tavole antiche, che assai si conservono, e ciò proviene da questa pratica della cola ; ma anco la polvere rovina assai, che osserverai dalle monache, da Riformati, e Capucini, che tengono le sue pitture nete da la polvere si conservano benissimo, et in fatti il gesso si vede che conserva molto bene il colorito. Ma per levar queste difficoltà, io adopro cola semplice come ti ho detto, che data doi volte apomicando ogni volta dopo asciuta acìo la tela venga liscia, li do poi la primitura macinata ad olio di lino, e tutte le terre sono buone per questa faccenda, secondo il gusto di chi comanda, io piglio terra da bocali, terra rossa, et un poca di terra d' ombra distemperate dopo fate in polvere sottile e passate in foco con olio di lino senza macinarle, le do con il cortelo supra dela tela, e dopo asciuta e pomicata, le do un altra mano macinata, e così resta impressa benissimo, e questo è un modo il più sicuro e migliore per la riuscita. Ho veduto anco metter

modelling than any other clay, because its particles are so minutely divided, that works made of it can not only receive the highest degree of polish, but the most minute works can be executed in it. It is dug at Rome, near St. Peter's, and at Monte Spertoli, 13 miles from Florence." It appears to be like what is called in England "China Clay."

finely powdered and mixed with linseed oil and stirred together for a short time, but not ground, over the fire. I then spread this preparation over the canvas with a knife, and when dry and pumiced, I give the canvas another coat of the same colours, but these must be previously ground, and thus the canvas will be well primed; this is the best mode and the most certain in its results. I have also seen some persons steep the "terra da bocali" in water to soften, when it liquefies immediately; then, removing as much water as possible, the same quantity of linseed oil as of the water which remains behind is to be added; then the different ingredients are stirred together with a spatula until well incorporated. The priming is then applied to the canvas for the first time, but for the second coat the ingredients must be previously ground as I have before said. This method succeeds well and is quickly done, as little colour is required in the second coat, the canvas being already made smooth with the first. To the first coat made with earth dis-tempered with water is added the oil which is pressed from the pencils when cleaning them, and which, being boiled with the sediment of the colours, dries like a mordant in the winter time; but umber is sufficient to make the second coat (which is ground) drying, and it does not require the boiled oil. This is the mode which I sometimes follow in preparing the canvas for my master, but the first mode which I mentioned to you is the best.

S. How shall I know whether the glue is too strong or too weak, when it is made, since it is used hot?

F. I touch it with two fingers, and feel whether it is tacky, and thus I ascertain the fact; if it is too strong, I add water, and do not let it boil any longer; and if too weak, I let it boil until I consider it is of the proper consistence; but take care you do not add to the glue either terretta or gesso, or anything, because these scale off in time; but use the pure glue, in order to spread the priming, and that the canvas may retain its strength, as I have told you.

S. When painters wish to paint on walls, how do they prepare them?

a mole nell' acqua la terra da bocale la quale si liquefa subito, e gitata poi fuori tutta l' acqua che può uscire, li getono tanto olio di lino quanto può esser l' acqua che vi è rimasta, e poi con una spatola la meschiono fino che s' incorpora, e poi la dano sopra le tele la prima volta, ma la seconda la dano macinata come t' ho detto, e riesce benissimo et è negotio breve che la seconda mano poco colore fa bisogno, essendo già fatta liscia con la prima, nella prima fatta di terra stemprata con l' acqua vi si pone olio che si neta li peneli, che bulito con questa fece di colori, seca come mordente nel tempo del verno, et ne la seconda che si macina, basta la terra d' ombra per far secante, ne ci vol olio coto. Questo è il modo che tengo alle volte preparar le tele al mio patrone, ma la meglio è nel primo modo che ti ho discorso.

S. Per conoscer la cola quando si fa, se è troppo forte, o dolce, perchè si da calda ?

F. Io toco con due dita e sento se ha picico nel asciugarsi, e da quello m' accorgo, se è troppo forte v' aggiungo dell' acqua e lascio levar il bolo, e se è dolce la lascio bolir fino che mi pare fatta giusto al bisogno, ma haverti di non por cosa alcuna, ne terreta, ne gesso, nella cola, perchè con il tempo si scorzano, ma solo si dà la cola pura, acìò si possa distender la primitura, e che la tela conservi la sua forza come t' ho detto.

S. Quando li Pitoni vogliono dipinger sopra muri in qual modo si preparano ?

F. On walls, neither glue nor gesso is used, because they would scale off in a short time, but the wall should merely be anointed with linseed oil, and after several days, when it is quite dry, a tint should be applied of earths ground up as a priming, and, when this is dry, the wall is ready for painting on. And in the same manner, to make coloured sketches on paper, a tint should first be laid with the brush, but let the paper be strong and well sized, such as the blue or the white.

S. And how is paper made transparent ?

F. Some sheets of huckster's paper, I do not exactly know what it is called, are glued together, according to the size of the picture or figure which is intended to be traced ; these sheets are then anointed with common oil, or, still better, with nut oil. There is also a good mode of oiling paper for the use of children when drawing, and also for laying over writing ; it is prepared thus :—Take, &c. ¹

Spread the oiled paper over the picture, and with a pencil or charcoal outline the figures, which are visible through the paper very clearly ; and if they are too black, they may be touched slightly with gesso on the darkest parts, not doing as some clumsy and imprudent persons do who outline the paintings with lake ground with oil, and afterwards oil the paper above it, and then press it with the hand until the above-mentioned outlines are impressed on the oiled paper. Such people ought to have their hands cut off as a punishment for the crime of spoiling such gems, especially when they are able to accomplish their object otherwise in a better manner ; but this is only practised by tracers, who rule their lines, and can do nothing but daub canvas, for virtuosi do not make marks on pictures. These proceed with proper respect, and those who have valuable pictures in their custody should be aware of this practice, and if they catch any of those clumsy fellows, they should kick them out, and send them to the gallows as

¹ A blank in the original, in which it was doubtless intended to copy a recipe.

F. Sopra muri non ci vol cola ne gesso perchè assolutamente in breve si scorzano, ma solo si unge con olio di lino il muro, e passati diversi giorni che sij benissimo asciuto se la da una tinta macinata di tere come primitura qual benissimo seca, può il Pittore dipingervi sopra. E cosi le carte per far modelli coloriti, si le da una tinta con il penelo, ma che la carta si forte, e che habi buona cola, come l' azzurra o bianca ma di quella reale.

S. Et lucidi come si farà ?

F. S' incola della carta da fatorela, non so il nome, quanta è la grandezza del quadro ovvero la figura che ci vuol lucidare, e poi si ungi ad olio comune ovvero di noce, che è meglio ; ma vi è anco un modo belo per unger carta qual serve a fanciuli per disegnar et anco per imponar a scrivere et è si, Piglia &c.—(sic)
(sic)

e detta carta unta si distendi sopra il quadro e si contorna con lapis o carboni le figure che gia spiccono benissimo e se fossero troppo nere si può legermente tocar con gesso nella parte più perse, e non far come certi sgratiati e temerarj che contornano le pitture con lacca a olio, e poi l' ogliono la carta di sopra, e con la mano le vano ritocando fino che resta impressi li sudetti contorni, che a questi bisognerebbe troncar le mani in pena di tal delitto, volendo guastar gioje cosi rare potendo in miglior modo conseguire il loro intento, ma ciò non viene usato se non da calcanti che vano rigando, e che non sano se non impiastrar telle, che li virtuosi non mettono le noti sopra le pitture. Codesti si va con que' rispeti che si deve et a ciò dovrebbero haver l' ochio chi le hano in custodia, che capitando di que' sgratiati scatiarli, e mandarli alle forche come indegni, ne lasciarli acostar a gioje si pretiose.

unfit to live, and not suffer them to approach such precious gems.

S. I myself have seen persons do this more than once ; but, having made this tracing paper, how is it used ?

F. A leaf of paper is covered with dry white lead or gesso, which, being placed between the tracing paper and the canvas, where it is oiled, the outlines of these figures are pressed with a needle of bone, and the coloured paper, which is placed between the two, leaves impressed all those marks which you have indented with the needle, and thus you will remove in regular order this coloured paper, having, however, fixed the tracing paper in two places that it may not move. I also do this, although I am not a painter, because it requires no skill in painting, but it is properly our business. And in the same manner, in order to transfer the design to white paper, the paper is coloured with charcoal, or with black or red chalk.

S. The “velo” which I have seen on a cartoon of my master’s, how is it used ?¹

F. It is applied on the painting like the tracing paper, and the outline is drawn on it with gesso. It is then removed to the primed canvas, and the marks, being pressed with a piece of linen held in the hand, are thus transferred to the primed canvas, or the gesso is again passed over the outlines which are transferred to the priming.

S. How is the Graticola² used ?

F. The Graticola is used in two ways : the picture which is to be copied is either crossed with white threads, or the Graticola, being made on a frame, is applied over the picture, and the same number of squares are to be struck on the primed canvas, which, whether it is larger or smaller than the painting, is to be divided in the same proportion.

¹ The “Velo” was used in a different manner by L. B. Alberti, who describes it in his Treatise on Painting, Lib. II. It consisted of a piece of transparent gauze stretched on a frame, and divided into equal parts by

S. Ho veduto più d' una volta ancor io a far di queste, ma fatto questo lucido, come s' adopra ?

F. Si tinge un foglio di carta con biaca suta ovvero giesso, qual posta tra il lucido e la tella ove sarà ogliato e con un ago di osso si calca li contorni di quelle figure, e quella carta tinta che fra posti, lascia impressi tutti quei segni, che haverai calcato con l' ago, e così trasporterai per ordine quella carta tinta havendo però saldata da due parti il lucido acì non si mova ; e questa la facio ancor io, benchè non son pittore, che in ciò non vi entra artificio di pittura, ma è una pura operatione nostra, e così per calcar sopra carta bianca, si tinge con carbone, lapis nero, ovvero rosso.

S. Il velo che ho veduto in un cartone del mio padrone come s' adopra ?

F. Quello si applica sopra la pittura come il lucido, e si contorna con il gesso, e poi si trasporta sopra la tella imprimita, e con una peza di lino si va con la mano calcando sopra quei segni e così restono impressi sopra la tella primita, overo che di nuovo si replica con il giesso sopra li contorni, quali trapasseno sopra la primitura.

S. La Graticola come s' adopera ?

F. La Graticola si fa in due modi, cioè è o sopra il quadro che si vuol copiare con fili bianchi, overo fata in un telaro, si applica sopra il medesimo quadro, e con l' istesso comparto si bate sopra la tella primita, che essendo maggiore o minore de la pittura si divide con la stessa proportionione.

threads drawn across it. It was placed perpendicularly between the painter and his subject, so that the rays of the visual cone might pass through it. The points of intersection were marked with a pencil, and thus a correct outline was obtained, which was afterwards transferred to a panel or wall.

² Graticola. A square divided by white crossed threads.

S. How are the lines struck ?

F. A thread is rubbed with dry gesso or white lead, and is beaten over the compartments exactly as the joiners do with terra rossa over their wood ; and the painters strike the lines of the architecture in their paintings in the same manner, drawing the lines to the point of sight.

S. Why do the painters use these tracing papers or grati-cola ?

F. In the first place, to avoid the tediousness of drawing their works, which, in fact, is not their business, but ours ; and, in the second place, to profit by it, as it enables their scholars to copy their works with greater perfection ; and this plan was employed by Bassano, and my master has a chest half full of the tracings by the sons of Bassano from the works of their father, which, being touched up by the master, pass as his works.

S. How are colours ground ?

F. The white lead is ground with nut oil ; “ verde eterno,”¹ Indigo, and all other blues, charcoal and the other colours, with linseed oil.

S. How are the stones cleaned after the colours are ground ?

F. With bran, and then with a piece of rag, and the palettes are cleaned in the same manner ; but take care that, when you leave off using the bran, you do not leave any flour behind, which may have an injurious effect on the colours ; for when you grind up fine lake, or “ verde eterno,” it will whiten and spoil, therefore the bran is better after it has been used several times.

S. And suppose it should happen that you forget to clean the palette, so that the colour dries on it, how should it be cleaned ?

F. With a little water and a pumice-stone.

S. How are the colours which have been ground preserved ?

¹ Purified or, as it is sometimes called, distilled verdigris.

S. Come si bate ?

F. Si tinge un filo con gesso overo biaca suta, e si bate sopra li comparti come fano li marangoni con la terra rossa sopra li legnami, e li pittori cosi batono l' architettura che fano sopra li quadri volendoli tirar al punto.

S. Perchè li Pittori usano questi lucidi o graticola ?

F. Prima per levarti il fastidio di queste faccende non essendo sue ma di noi altri, e per valersi acìo li scolari copiino le loro opere con maggior perfetione, il che usò il Bassano, che apunto il mio Padrone ne ha meza una cassa di lucidi de figli del Bassano trati dalle opere del padre, che in tal guisa ritocate da maestri corrono come sue.

S. Li colori come si macinano ?

F. La Biaca con olio di noce, il verde eterno, e l' Endico e cosi tutti gl' azzurri, et anco il carbone et gl' altri con olio di lino.

S. Come si neta le petre quando si è macinato li colori ?

F. Con la semola di formento e poi con un pezo di stratio, e cosi istessamente le tavolozze ; ma averti che quando la semola non è più stata adoperata, lascia qualche poco di farina si che habi l' actio, che se macinarai laca fina o verde eterno bianchegiono e si guastono, e perciò la semola è meglio come si è adoperata diverse volte.

S. E se per caso si scordasse di netar che il color si secasse, come si neta ?

F. Con un poca d' acqua et una pietra pomica.

S. Li colori macinati come si tengono ?

F. In divers ways, viz.—in folded papers, in small saucers, and in bladders; and this last is the best mode, for the colours keep better; but white lead is kept in a vase with water; the palettes also are placed in water, just as they are set in order, that the colours may not dry when the painter wishes to use them the following day; but remember that lake, giallo santo, and verderame are spoiled by the water, and they must be taken off the palettes before they are put under water.

S. How are the pencils preserved?

F. They are kept in linseed oil, and with that they are cleaned, pressing out the colour with a knife on a palette suspended over a vessel of oil, which oil you may afterwards keep for distempering the primings, as I have before told you; but the large brushes should be cleaned with soap and water, especially if they are afterwards to be used with blues, but as soon as they are dry wipe them well with a linen rag; then wind a thread round them from the handle to the extremity of the hairs, to keep them closer together, otherwise they will spread like flattened fungi.

S. How is boiled oil prepared?

F. The linseed oil is put into a clean pipkin or saucepan with some litharge of gold,¹ which is tied up in a rag, and fixed to a small piece of wood, which being laid across the pipkin or saucepan, suspends the rag so that it does not touch the bottom, because, if it should touch, it would burn, and the oil would become black, and when the oil boiled it would rise to the brim of the pipkin and flow over, but when the litharge is suspended these effects are not so easily produced. If the oil is boiled very much it will be more drying, and so whether you use much or little litharge; you may also boil with it a little umber, this will have the same effect, except that the oil will not be so light coloured. Sometimes also the oil, soiled with the colours pressed from the brushes, is boiled with olio di abezzo, and is applied to the backs of old pictures, which are scaling off their grounds, in order to fix them.

¹ It is unnecessary to observe that litharge of gold and silver are the

F. In diversi modi cioè nelle carte piegate, ne scudelini, nelle vesiche, e questo è il meglio che si conservano più, ma la biaca si tiene in un vaso con acqua che apunto le tavolozze come sono preparate si metono nel acqua a ciò li colori non si sechino, volendoli adoperare il pittor il giorno dietro, ma avverti che la lacca, il giallo santo, et il verderame patiscono, e bisogna levarli avanti che si meta nel acqua.

S. Li peneli come si tengono ?

F. Si tengono nell' olio di lino, e con quello si netano, cavadoli il colore con un cortelo sopra d'una tavoluzza pendente sopra il catino dell' olio, qual olio poi ti serve per stemprar le primitive come t' ho detto, ma li grandi il meglio è netarli con sapone et acqua, massime come devono esser adoperati con azurri, ma haverti che come sono neti asciugali bene con una peza di lino, e poi legali con filo dal manico fino alla estremità delle sete acìò restino più unite che altrimenti s' alargono come le vesce sponate [spianate?].

S. L' olio coto come si fa ?

F. Si pone l' olio di lino in un pignato o calderola neta e vi si pone del retargirio d' oro, legato in una pezzetta, legato con un filo e saldata ad un legneto che passi attraverso del pignato o calderola, lo sostenti che non tochi il fondo, perchè come tocha il fondo s' abbrucia, e l' olio vien nero, et anco volendo sormonta l'orlo del vaso e si spande, che così sospeso non fa tal effetto così facilmente, se bole assai si fa più disecante, e così dal porvi più o meno retargirio si può anco cucinar con un pezzo di terra d' ombra e fa l' istesso, ma non resta così chiaro. Si cucina alle volte anco l' olio sporco con colori con olio d' abete e questo si da dal rovescio alli quadri che vechij che si scorzano per saldarli.

same things. They derived their names from being extracted from ores which contained gold or silver. Litharge is the semi-vitrified oxide of lead.

S. How are varnishes made ?

F. Varnishes are of different kinds: some we make ourselves, others, such as the “vernice grossa” and amber varnish, we purchase, but I make the mastic varnish myself.

S. Tell me how you make it ?

F. I take pulverized white mastic, and put it into a pipkin with spirit of turpentine, or naphtha, in such quantities that the spirit of turpentine may rise two-thirds above the mastic in the pipkin. I then set the pipkin over the fire, and boil it until the mastic is perfectly dissolved, and sometimes add to it a little “olio d’abruzzo.” This serves for varnishing finished pictures, but if you wish to see divers modes of preparing these varnishes, consult Armenino da Faenza and Rafael Borghini, who teach all things pertaining to our trade, and how to make other kinds of varnishes, as well as the proper mode of using them.

S. I have not these books, nor can I see them.

F. Borrow them, and write down what you wish to know on this subject; perhaps your master may have the works, and then you may use them, because as they wrote of other things appertaining to painters, if your master studies painting, he will most certainly have them.

S. If they treat of painting, they will not write on these things which pertain neither to the art nor the artist, for this would be unbecoming, because our operations are merely vile and mechanical, and require no skill, but merely the labour of the hands.

F. They were not prudent enough to separate these things, and it is very proper that painters should understand them and know their use, so as to give orders to those whose business it is to prepare them, and to know whether the things made are perfect, and also to know good colours, but then they are not obliged to manufacture these things themselves.

S. How are good colours known from bad, because sometimes my master sends me [to purchase colours], and I have not had much experience on this subject ?

F. Many are known by the eye, others by grinding them on the stone, others on the palette, in using them, and others dur-

S. Le vernici come si fanno ?

F. Le vernici sono diverse, altre le facciamo noi, altre si comprano, come la vernice grossa, quella d' ambra si compra, quella di mastice la faccio io.

S. Dimi dunque come fai ?

F. Si piglia mastici bianchi polverizzati, si pone in una ampola con acqua di ragia ovvero olio di sasso, la sua proporzione si che l' acqua di rasa sormenti due terzi sopra li mastici, si pone al foco, si fa bolir sino che li mastici siino bene liquefati, se le può agiunger anco un poco d' olio d' abezzo, e questa serve per dar sopra li quadri forniti, e se voi vedere diversi modi circa queste vernici, vedi Armenino da Faenza e Rafael Borgini (*sic*) che insegnano tutte le cose appartenenti al nostro mestiere, altri diverse sorte di vernice con il modo proprio di adoperarle.

S. Io non li ho, non li posso vedere.

F. Trova l' imprestito e scrivi ciò che ti fa bisogno in questi particolari ; e forse il tuo Patrone li haverà e te ne potrai servire perchè scriveva altre cose appartenenti a Pittori, e se è già studioso della pittura li haverà certamente.

S. Se tratono di pittura non scriverano di queste materie che non s' appartengono ne a l' arte ne agli artefici che saria cosa indecente ; che le nostre operationi sono vili e mecaniche, ne vi entra altro artificio che un lavorar di mani.

F. Non hano havuto questa prudenza di separar le cose, è bene che il pittor le conosca e sapia, per potersi far bene servire et ordinar a chi toca tale operatione, e per conoscer le cose fate, se sono perfette, come anco il conoscer li buoni colori, ma non sono tenuti a fabricarli.

S. Come si conosce li buoni colori da cattivi, perchè alle volte il mio padrone mi manda e non ho molta pratica ?

F. Molti si conoscon nel vederli, altri sopra la pietra nel macinarli, altri sopra la tavolozza nel adoperarli, et altri posti

ing the painting, but the knowledge of the last is the painter's business, and not ours, for we do not paint.

S. Give me some rule by which I may know them.

F. The first rule is, that they must be of beautiful colour, as white lead, lake, the blues, cinnabar, red lead, "giallorino," "giallo santo," &c. ; those colours which are in powder must be very finely pulverized. But with respect to the others, "smaltino" should be very bright, and so should all other blues. If you wish to know whether the ultramarine is adulterated, put it over the fire in a spoon ; if it resists, it is good, but if it blackens, it is bad. The lakes should not only be beautiful and of lively colour, but in the grinding they should have body and not be liquid. The giallo santo, on the contrary, should be of fine colour, and in grinding should become very liquid so as to require very little oil in distempering, and should dry very quickly, which is a sign that it is pure ; but if it hardens and requires a great deal of oil in grinding, that is a proof that it contains dirt or other impurities, and in this case it dries slowly and fades on the pictures. In the same manner, the lake which dries quickly is the best, and the "verde eterno" should be crystalline, clear, and of a lively colour. And the last test for the colours is to place the pictures in the sun ; if they are not injured they are good, but if the colours fade they are bad, especially the giallo santo, the lake, and the indico. The earths in the lump are best, because they are natural, and there is no other material mixed with them ; but the venders are accustomed to falsify everything in order to promote their own interests, and for this reason Borghini teaches the making of all colours, so that we may learn to manufacture them and to have them perfect, i. e., those which are most important, because it is much better to buy some colours ready made.

S. Are there not many colours which require to be burnt ? how is this done ?

F. Umber, yellow, green, and red earths should all be burnt in the fire, placing them over a slow fire that they may not break from the excessive heat ; they are gradually made hotter until

in opera, e questa cognitione e del pittor che noi non dipingemo.

S. Dami un poco di regola per conoscerli.

F. La prima cognitione e che siino di bellissimo colore, comè la biaca, la laca, gl' azurri, il cinaprio, e el minio, gialorino, e giallo santo etc. quelli che sono in polvere siino sottilissimi. Ma gl' altri, il smaltino e che sii chiaro di colore, e cosi tutti gl' altri azurri, l' oltremarino per conoscerlo se è adulterato, si pone al foco sopra un guchiaro, se resiste è buono, se anerisce è cattivo. Le lache deno esser non solo belissime di color vivace ma che nel macinar abino corpo, e che non inliquidiscon. Il giallo santo il contrario sii bello di colore, ma che nel macinar venga liquido che con pochissimo olio si stempera, et asciuga prestissimo che è segno che è puro, ma come s' indurisce e che ci vole assai olio nel macinarlo, e segno che ha delle feci o di materia cativa e stenta asciugarsi, e nelle piture si perde, e così anche la laca che asciuga presto e la meglio, il verde eterno si cristalino chiaro e di color vivace. E la prova ultima che si da ai colori è il por li quadri al sole, se resistono sono buoni, ma come svaniscono sono cativi, massime il giallo santo, la laca, e l' endico; le terre le grezze sono migliori, perchè sono naturali, e non v' è altra materia mista perchè uson per interesse a falsificar tutte le cose, e perciò il Borgini insegna a far tutti li colori, si che noi potiamo aprender il modo di fabricarli per haverli perfetti, cioè li più importanti perchè di molti è meglio il trovarli fatti.

S. Non vi sono molti colori che si abruciono? dimi in qual maniera.

F. La terra d' ombra, la giala, la verde, e la rossa, tutte s' abruciono nel foco ponendole a foco lento acìò non si spezino per la troppa veemenza del calore, ma a poco a poco si riscal-

they have a most vehement heat and are roasted ; they are then sufficiently burnt. The yellow, however, is pulverized, and then burnt on a fire-shovel until it blackens, and when it cools it becomes of a dark red colour.

S. Tell me, pray, do you set your master's palette?

F. Certainly ; I also distemper all the powder colours, and it is sufficient for him to tell me what he is going to paint, for I know what colours I ought to put on the palette ; I wash the abbozzi, I oil them, I varnish them, and on some I lay the white of egg according to his orders ; and then he has given me in writing full instructions in the distemperring of the colours that I may know what to do, and his directions exactly correspond with those of Armenino da Faenza, and thus you also may write them out, for besides this he teaches the whole process. Father Lana¹ also, a Jesuit, has treated of this matter in his discourse on painting. And remember to put boiled linseed oil

¹ The treatise is contained in a larger work, entitled, "Prodomo ovvero Saggio di alcune Inventioni nuove premesso al opera che prepara il P. Francesco Lana, Bresciano, della Compagnia de Gesù;" Brescia, 1670, fol. The part which relates to painting begins at p. 135. Four chapters are devoted to this subject ; Cap. I. treats of Invention, Cap. II. of Design, Cap. III. of Colouring, and Cap. IV. of different methods of Painting and Drawing. The chapter on Colouring contains the usual directions for painting with four colours—a recommendation to mix ultramarine with all the flesh tints—full directions for mixing various tints on the palette, but none as to the mixing of the pigments with any liquid—as to the distribution of the light—and of the light in which a painting is to be placed while in progress. The directions as to "oiling out" are precise. Lana recommends for this purpose "boiled linseed oil, that is to say, linseed oil to which have been added two ounces of litharge for each pound of oil, warmed until it begins to boil." "This application," he says, "is not injurious to the picture, as some have imagined ; and the advantage is that it dries quickly, for raw oil is a long time in drying."

According to P. Lana, "The priming consists in covering the picture with some colour, which is usually umber finely ground with a little white lead and terra rossa, in linseed oil ; this mixture being very stiff, and less liquid than the other colours, is spread evenly and thinly over the picture with a large knife ; when it is dry, another coat is to be applied, and after this, a third coat ; which I do not approve of, because, being too thick, it causes the colours which are laid on it to change, for these sink into it so much, that they

dono, e poi se li da foco vehemente fino che s' arrossiscono ; et allora sono arse. La giala, però, si spolveriza e s' abrucia sopra la paleta da fuoco, fino che anerisce, che rafdredata divene rossa oscura.

S. Dimi in grazia, prepari tu la tavolozza al tuo padrone ?

F. Certo che si, li stempro anco tutti li colori che sono in polvere, e mi basta che mi dica ciò che vol dipinger, che so quali devo pore sopra la tavolozza, lavo gli abozzi, li ungo, li do la vernice, et altri ancora la chiara d' uova secondo mi comanda, e poi mi ha dato in scritto tutto ciò che occorre nel distemperar de colori, a ciò sapia ciò che devo fare, et è apunto come insegna Armenino da Faenza, e cosi li potrai scriver ancor tu che insegna il tutto et anco il P. Lana Gesuita ha scritto di questa materia nel suo discorso di pittura. Et haverti che nè colori che difficilmente s' asciugono di porvi de l' olio coto et anco verderame, come nel nero fumo et aspalto, e così l' azuro di Spagna

participate of the colour of the priming itself. But in order that the colours should retain their brilliancy, the same colour should be repeated several times upon the first, and the parts should be more charged with colour than the life ; for instance, in colouring the cheeks, or other parts, with cinnabar and lake, they should be made a little more rosy than the natural carnations, because, after a time, they sink, and are toned down to their natural hue ; without this precaution, they would become too pale and dead."—p. 158.

In Cap. IV. Lana treats of the different methods of painting, in distemper, in oil, and fresco ; also of miniature painting, painting on marble, on silk, tapestry, mosaics, and metals.

In page 165, he observes that, " when the painting is finished, some painters are accustomed to varnish it, in order that the work may be more smooth and brilliant."

He then mentions an invention of his own for painting on glass, and afterwards treats of engraving.

The remainder of the work treats of other inventions. I have been thus particular in detailing the technical processes described in this Treatise, because the work itself is rare ; and, as it treats on other subjects, it is not likely to form part of the library of a painter. Indeed, it is so little known, that the scanty notice of it in the work of Volpato is the only reference I have ever found to it ; and it was not without considerable research that I at last ascertained, that the Treatise of Padre Lana, on Painting, was contained in the above-mentioned work.

and verdigris with the colours which dry slowly, such as lamp black and asphaltum. And in like manner the Spanish blue¹ should be distempered as stiffly as possible with nut oil. The painters make it flow with spirit of turpentine, and ultramarine with naphtha.

S. How do you varnish with the white of egg?

F. I apply the white of egg upon those [pictures] which he finishes without having varnished the abozzo, and which he completes by merely "oiling out" and then retouching until finished, and on the others I apply mastic varnish. I beat up this white of egg well with a spoon, agitating it till it flows well through a rag, and adding to it a little garlic cut small, which has a good effect, and this was used by Canziani on his paintings. Your master will order all the rest that you may have to do.

S. I am in a great fright and do not know what course to take; the other day I let a canvas fall against a box, and injured it so much that there is a large lump on one side; and what makes the matter worse is, that my master is going to use the canvas so soon that I shall not have time to prepare another, nor can I get any canvas of that size, and I should not like my master to know it and be vexed about it; what would you advise me to do?

F. Are the threads broken?

S. There is no hole in it, but it is in such a state that it cannot be used.

F. What will you give me to tell you how to set it to rights?

S. Whatever you please, for I am very much annoyed at the accident, as it is a large canvas and of some value.

F. We will share the reward between us, for I wish you only, as it were, to change wine for water.

S. Most willingly; but how is this change to be effected?

¹ This was probably the "azzurri di Spagna" mentioned by Malvasia, Felsina Pittrice, Vol. II., p. 349, which I consider (see Art of Fresco Painting, Int., p. xlvi.) to be the native Blue Carbonate of Copper.

stemperalo più sodo che si può con olio di noce, li pittori lo fano score con l'acqua di rasa, e l'oltremarino con l'olio di sasso.

S. Dimi come le dai la chiara d'ovo?

F. Quelli che fornisce senza dar vernice sopra l'abbozzo, che solo con il lavor li fornisce e con l' unger li ritocca, a quei li do la chiara d' uovo, et a gl' altri la vernice di mastici ; e questa chiara la rompo benissimo con un guchiaro, agitandola fra pezza, ponendovi dentro un poco d' alio tagliato minuto, che fa bell' effetto, e cio usava il Canziani sopra de suoi quadri e poi il tuo patrone ti ordinarà ciò che devi fare.

S. Io son molto intricato, ne so qual partito pigliare, l' altro giorno è cascata una tela sopra uno scrigno, et è sfondata con un rilievo bestiale, et il Patrone la deve pore in opera in breve, che non ho tempo di prepararne altra, ne di quella misura non ne trovo, perchè non vorrei che s' acorgesse e ricever qualche mortificazione, cosa mi consigli che faccia ?

F. E rota ?

S. Non è forata, ma in quel modo non si può adoperare.

F. Cosa mi voi donare che t' insegno il modo di agiustarla?

S. Ciò che voi, perchè mi preme ; essendo tela grande di qualche consideratione.

F. Goderemo insieme il mercato, che altro non voglio da te che in tal guisa contracambierai vino per acqua.

S. Più che volentieri, ma in che modo farò questo cambio ?

² Gio. Batista Canziani was a native of Verona and pupil of Antonio Calza ; he flourished about 1712. Vide Crespi, Pittori di Bologna, p. 189.

F. Bathe with tepid water the back of the canvas, and it will become even.

S. I am very much obliged to you, for I did not at all know what to do, but I have another difficulty; my master has several pictures soiled by smoke, and has told me to wash them, but I do not know how.

F. It must be some trick he wishes to play a friend or patron, because good pictures either never are washed or the owners perform this operation themselves; and it is not merely a mechanical operation, because the pictures are easily spoiled, for if washed too much, those last retouchings which are the perfection of the work are effaced, and I have seen many paintings spoiled in this manner by ignorant persons who know not what mischief they do. And I have even seen them wash paintings on panel and on canvas, in such a way that after being washed they have scaled off, because the gesso underneath was affected by the moisture, and swelled; therefore it is great folly to wash good paintings.

S. I do not understand, or know anything about it.

F. Your master ought to know this himself.

S. But how should I wash them?

F. Take some ashes, which have been sifted very fine that there may not be any pieces of charcoal or any large substances which may scratch the picture; put them into a small pipkin with pure water, and with a sponge spread them all over the painting, and clean it by moving about the sponge gently, then wash it off quickly with pure water, because the ashes corrode the colour. Afterwards wash it well with clear water, dry it with a linen cloth, and then varnish it with white of egg.

S. But should it not be oiled?

F. No, for the oil is not good on pictures, except on their backs when they are scaling off, as I have told you; and in proof of this, see the Saint Peter the Martyr, at Venice, who having been oiled so many times by sacrilegious blockheads who have copied him, is so spoiled and blackened, that there is no telling what sort of face he has, and yet I recollect when he

F. Bagna con acqua tiepida dal rovescio dela tela, che il servitio sarà fato, e resterà ugualgiato.

S. Ti ringratio infinitamente, perchè era molto intricato ; ma un altra cosa, il mio Patrone ha diversi quadri afumicati, m' ha detto che vol che li lavi, io non so come fare.

F. Sarà qualche stratio per agradir qualche suo amico o patrone perchè quadri buoni, o che non si lavono mai, overo che lo fano loro, e non è cosa da manuali, perchè si possono guastar facilmente, che con il lavarli troppo se le consuma què ultimi ritochi che sono la perfetione de l' opera, come ne ho veduti tanti cosi guasti, per mezo di ignoranti che non sano ciò che fano. E di più ho veduto anco lavar quadri in tavola e cosi in tela, che dopo lavati si sono scorzati, perchè il gesso di sotto risente quell' umido e si rileva ; e perciò è gran pazzia lavar quadri buoni.

S. Non me ne intendo, ne so quel che sia.

F. Lo deve saper lui.

S. Come dovrò fare per lavarli ?

F. Prendi un poca di cenere sedazata sotilmente acìò non vi sii carbone o materia grossa che possa raschiar il quadro, ponila in una scudela con acqua pura, e con una sponga distendila sopra il quadro, e leggermente maneggia la sponga netandolo, ma fa presto a levar con acqua chiara la sud^{ta} cenere per che rode il colore. Lavato bene con acqua chiara, asciugala con un drapo di lino, et asciuto come sij, dali la chiara d'ovo.

S. Che lo ungesi ?

F. Non lo fare, che l' olio non fa bene a quadri, se non dal rovescio, come si scorzano come ti ho detto, e che ciò sia vero, vedi il S. Pietro Martire di Venezia, che unto tante volte da sacrilegi e sgratiati che lo copiano l' hano cosi guasto et anerito che non si vede più che faccia egli abia ; e pur a miei giorni era bellissimo, e puoi osservare li putini che essendo alti lontani da

was beautiful, and you may observe the children, which being above the reach of similar influences, are in excellent preservation, therefore these blackguards should be forbidden to copy such excellent works. This privilege should only be permitted to those who have a proper respect for pictures. Do you wish me to tell you anything else ?

S. One thing, about which I am curious : my master has made me grind up several colours with pure water, and tells me he wants to make crayons of them for colouring on paper. What are these crayons, and how are they made ?

F. You will see, because he will make the tints with the knife, and will make you point the crayons for use. But in order that the white lead and the powder colours may adhere together, he will tell you to add gum-water to them to make them firm so that they may be used, but the lamp black is formed into a paste with the "terra da bocali," and dried by the fire, and is sometimes used instead of charcoal for drawing.

S. How is charcoal made ?

F. An iron tube is provided, the pieces of wood are pressed tightly into this, and the ends of the tube are stopped up with ashes that the smoke may not escape, and when the tube is red hot and no more smoke is given out, the charcoal is made ; the whole is then thrown into water.

S. What sort of wood is used ?

F. The plum-tree and the willow.

S. Why is the tube fastened up air-tight ?

F. Because if the wood were to burn, it would fall to ashes without making charcoal : when the crayons are made they are anointed with common oil, so that when used the marks may not be cancelled. Is there anything else you wish to know, for I would willingly communicate everything to you ?

S. I am very much obliged to you, and I think I want no more instructions for my functions ; if I have any difficulty I will consult you. It is now time, however, for you to go to the "piazza," and take your salad for supper ; our masters will perhaps come home late this evening.

simili infusi sono conservati bellissimi, e perciò si dovrebbe vietare a questa sorte di canagle il copiar opere si fatte, e solo permeterlo a soggetti che portano a quadri li dovuti rispetti. Desideri saper altro da me ?

S. Una curiosità. Il mio patrone mi ha fatto macinar diversi colori con acqua pura, e mi dice che vol far delle paste per colorir sopra le carte. Cosa sono queste paste e come si fanno ?

F. Lo vederai perchè farà le tinte con il cortelo, e poi ti farà far le punte a te per adoperarli. Ma perchè la biaca e quelli che sono in polvere stijnno saldi, ti farà meter un poca d' acqua di goma a ciò siino salde per poterle adoperare, ma il nero fumo s' impasta con terra da bocali, e si seca al foco e serve anco per carbone da disegnare.

S. Il carbone come si fa ?

F. Si piglia una cana di fero, vi si pone dentro li stechi di legno ben serati, si atura con cenere delle parti di detta cana essendo posta nel focco acì il fumo non esali, e come la cana è infocata, e che si vede che non esala più fumo, il carbone è fato, s' estingue il tutto nel acqua.

S. Che sorte di legno s' adopera ?

F. Si piglia il susin, ed il salice.

S. Perchè s' atura e non si lascia respirare ?

F. Perchè ardendo andarebbe in cenere, ne si faria carbone, qual fatto si unge con olio comune acì che adoperato non si cancelli. Vedi s' altro ti occorre, che ti dirò il tutto volontieri.

S. Ti ringrazio infinitamente, che per la mia fontione altro non fa bisogno, e se haverò qualche difficoltà ti verò a trovare. Fra tanto è hora che vadi alla piazza a piglar l'insalata per la cena, li nostri patroni forse verano tardi questa sera.

F. Mine is not gone far. They will come home at the usual time ; but before you go, I beg you will take a glass of wine, come.

S. This cellar is very cool.

F. Take this wine and taste it, it will taste as if it were iced.

S. To the health of our masters !

F. To theirs and to our own !

S. Truly, it is very cool.

F. Now I will taste it, in confirmation of what you say.

S. I will take another glass.

F. Two or three, if you like.

S. One will do for the present.

F. Take it.

S. And with this I will drink your good health.

F. May you long continue in good health.

F. E poco lontano. Verano all' ora solita. Avanti che ti parti, bevi un bichier di vino. Andiamo.

S. Questa cantina è molto fresca.

F. Prendi e gusterai il vino che pare che sii in giaza.

S. Alla salute de nostri patroni !

F. Alla sua et alla nostra ancora !

S. Veramente è freschissimo.

F. Hora lo gusterò anch' io alla confirmatione di quanto hai detto.

S. Ne voglo un altro bichier.

F. Anco doi e tre se ti gusta.

S. Un sol mi basta per hora.

F. Prendi.

S. E con questo ti lascio la buona salute.

F. In buon vigore conservati.

BRUSSELS MANUSCRIPT,

ENTITLED

**“RECUEIL DES ESSAIES DES MERVEILLES
DE LA PEINTURE.”**

BY

**PIERRE LEBRUN, PAINTER,
1635.**

BRUSSELS MANUSCRIPT.

PRELIMINARY OBSERVATIONS.

THE following pages are copied from the commencement of a MS., preserved in the Public Library at Brussels, numbered 15,552, written in 1635 by Pierre Le Brun, a painter. The MS. is in small octavo, the writing extremely small and difficult to read, and the ink very pale. It appears to have been intended for publication, as it contains many drawings. The part of the MS. uncopied treats of Sculpture, Architecture, and Perspective.

It appears from the MS. that Pierre Le Brun was contemporary with the Carracci, with Rubens, Laurens Dubry the Fleming, and Vouet; and the scattered notices he has given relative to painting in oil must be considered as indications of the practice of this art in France, or rather at Paris, during the middle of the seventeenth century. The manner in which the author speaks of contemporary artists shows that he was living at Paris when the MS. was written.

The object of the author in writing the treatise seems to have been to give amateurs such a knowledge of the mechanical parts of the art, and of technical terms, as would enable them to speak on the subject of painting with propriety, and without incurring ridicule.

In the first chapter, therefore, he describes the implements used in the mechanical part of the art, and then recapitulates a number of technical expressions, some few of which he explains, especially those relating to the light in which a picture should be viewed. This part of the work bears much resemblance to the Treatise of Bulengerus, *De Pictura, Plasticæ, et Statuaria*, lib. ii. cap. ii., a work which must have obtained some reputation, since it has passed through three editions, and has been translated into English.¹

The author then treats of painting in distemper and in fresco; and he cites, as authority for the rules he lays down for fresco-painting, Father L'Ange and Father Antoine the Capuchin, and M. Thierson, a painter. The latter he mentions frequently in the course of the work.

The fourth chapter treats of painting on glass; and I find, by comparing this chapter with the second part of Le Vieil's "*Art de la Peinture sur Verre*," that the method described in the MS. was that which was generally followed in France. The practice of the art, therefore, appears to have changed but little from the time of Le Brun (1635) to the date of the work of Le Vieil, 1774.

In the fifth and sixth chapters, Le Brun treats of the proportion of the human body and of the beauty of the

¹ The first Latin edition was printed at Leyden in 1621, and the English translation in 1657. The work is mentioned in the letters of Rubens, who merely states that he had received the work, but had not had time to read it. It appears from the explanations of many of the technical terms being in French, that the author was a Frenchman. His name, probably, was Boulanger.

face, and in the seventh he teaches the nature and composition of colours. He describes six kinds of azure, the first of which, called *Cerulée* or "*Turchino*," is the azure of Pozzuoli, of Vitruvius, and the smaltino of the Italians. The second, formed of mercury, sulphur, and sal ammoniac, has been called *Venetian azure*. The third, which is called "*Ultramarine*," is said to consist of calcined silver, aqua fortis, and sal ammoniac. The fourth is the Carbonate of Copper, mentioned in the first chapter under the name of "*La Cendrée*." The fifth is *Indico*, composed of the scum of woad, starch, &c.; and the sixth is the true *Ultramarine*.

The eighth chapter, entitled *Secrets in Painting*, consists of detached hints relative to the technical parts of the art. From these it appears that white was to be excluded from shadows (see No. 1), which we know was in accordance with the precept of Rubens.

In No. 42, *Umber* and *Lake* are mentioned as forming a beautiful colour for shadows. The directions given in No. 7, "*Il faut fort ombrer en esbauchant*," and the reason given for it, "*cela ayde a parachever avec plus grande facilité*," appear to me to recommend the Flemish practice of getting in the subject in *chiaroscuro*, after which it was necessary merely to apply the lights and local colours, leaving the deep shadows free from solid or opaque colour. In No. 10 it is recommended not to use *umber* in the grounds, because the colours sink into it. No. 19 shows that the colour of the grounds was generally of a yellow colour, the method of preparing which appears to be described in Chapter I. In No. 32 a process is mentioned by

which a canvas can be prepared so quickly that a person may paint on it the same day. The author also advises the use of mineral colours, which were to be previously ground with oil (see Cap. I.), and recommends that paintings should be exposed to the air. Nos. 23, 24, and 25 describe the method of preparing both drying and fat oils, which were to be used for promoting the drying of certain colours, among which we find white lead, which is not usually placed among the slow dryers. Ground glass and verdigris are also said to be mixed with colours to make them dry.

The method of applying the azure in powder, described in No. 39, is curious, but not uncommon, since it is mentioned several times in the MS. of De Mayerne¹ in the British Museum.

No. 40 shows that even so late as 1635 statues or bassi rilievi were painted with colours.

In order to preserve pictures from dust and fly marks, it is recommended (No. 22) to wash them with white of egg, and the reason for using this is stated to be that it may be easily washed off with a damp sponge. It is added, "this cannot be done with varnish." From this then it appears that it was not always usual to varnish paintings in oil, and this certainly implies that they were painted with a vehicle *which rendered varnishing unnecessary*; thus affording evidence of the truth of Vasari's statement that pictures painted in the manner of Van Eyck did not require varnishing.

The MS. contains no directions as to the vehicle; it is merely stated that the colours were to be ground with

¹ See Mr. Eastlake's 'Materials,' &c., vol. i. p. 455, 456.

oil, and that certain colours were to be used with drying oil, in order to make them more siccativæ. In No. 14, Oil of "Camamine" (Chamomile) is mentioned,¹ but on account of the difficulty of deciphering the MS., it is scarcely possible to distinguish whether Le Brun has written "bonne pour peindre," or "bonne pour prendre." The supposition, coupled with the conclusion of the sentence, "it is as clear as rock water," is certainly in favour of the first reading, whence we may suppose that oil of chamomile was used to dilute the colours in the same manner as spirit of turpentine is now used.

With regard to the varnishes described in the MS., it will be observed that they are not oleo-resinous. The first varnish for pictures consists of mastic and "huile de sapin," which appears to be synonymous, or nearly so, with the "olio di abezzo" of the Italians. The second consisted of turpentine liquefied over the fire, thinned with oil of spike. The "Vernis Gros" ("vernice grossa" of the Italians) or common varnish was made of turpentine, oil of turpentine, and resin melted together. The two former, at least, were probably light-coloured varnishes; the colour of the last seems doubtful. A passage in Chapter I. (No. 16) suggests the idea of a high-coloured varnish having been used occasionally "to lower the brilliancy of the colours." This may have been a relic of an older practice, and

¹ The distilled oil of chamomile (*Oleum Anthemidis*) is sometimes of a blue colour: that which is found in the shops is generally foreign, of a yellowish or brownish yellow colour, and becomes viscid by age.—Brande's Dictionary, &c.

appears more applicable to an oleo-resinous varnish than to one of those described in the MS.

Chapter IX. teaches how to speak of beautiful paintings; and Chapter X. is an account of the greatest painters in the world. The author commences this chapter with an extract from Quintilian (ch. 16, l. 12), giving a brief account of a few of the great painters of antiquity. He then speaks of the moderns, among whom he mentions Michael Angelo as a distinct person from Buonarotti. From the painters of the cinquecento he passes to the artists who were contemporary with him, among whom he enumerates the Carracci, Rubens, and Simon Vouet, and he concludes this part of the work with observing that his friend M. Thierson, to whom he was indebted for many hints for his work, "is also a very clever man."

Chapter XI. treats of the various methods of gilding, and the work concludes with the recipes for varnish before mentioned.

COLLECTION OF ESSAYS,
ETC.

COLLECTION OF ESSAYS ON THE WONDERS
OF PAINTING,

By PIERRE LEBRUN, PAINTER,
1635.

PREFACE TO THE READER.

WHEN Alexander the Great visited Apelles the Great, and began to talk of colours and paintings, the apprentices burst into a loud laugh, so that their master was frightened and ashamed of them, and whispered to Alexander, saying, "Sire, I entreat you will not speak of the profession, for the boys who are grinding the colours are bursting with laughter at the mistakes you make: you are good for conquering worlds, we for representing them on pictures; your sword and our pencils in the same hand do not agree, and, to do well, every one should speak of his own trade, otherwise he furnishes a subject of laughter to the whole company." Alexander was silent, and laughed. Reader—my dear friend, I desire to free you from this annoyance, and from the fear that your ignorance should be the subject of derision, when you speak of painting on a flat surface, one of the most noble arts of the world. The greatest deceiver in the world is the greatest painter of the universe and the most excellent workman; for, to tell the truth, eminence in this art consists in a deception, innocent, and full of enthusiasm and divine spirit. Poets have their inspirations in the head, which is the seat of the poetic nerve; painters in the tips of the fingers, and in the flowing point of the pencil. But the eye must be deceived, or the picture is worth nothing; this must appear

RECUEUIL DES ESSAIES DES MERVEILLES
DE LA PEINTURE,

DE PIERRE LEBRUN, PEINTRE,
1635.

PRÉFACE AU LECTEUR DE LA PEINTURE.

QUAND le grand Alexandre visitant Apelles le grand voulut parler des couleurs et des peintures, les Apprentis esclattèrent si fort de rire que le maistre en eust peur et honte. Sire (dit-il tout bas) ne parlez point de le mestier car les garçons qui broient les couleurs crevent de rire vous entendant ainsi begayes : vous estes bon pour conquerir les mondes, et nous pour les coucher sur nos tableaux. Vostre espée et nos pinceaux ne s'accordent pas bien en une mesme main, et pour bien faire chacun doit parler de son mestier autrement on appreste à rire à toute la compagnie. Alexandre se teut et se print à rire. Je desire lecteur mon grand amy, vous delivrer de ceste peine, et de la peur qu'on ne se gausse de vostre niaiserie quand vous voudrez parler de la platte peinture, l'un des nobles artifices du monde, le plus grand trompeur du monde c'est le meilleur peintre de l'univers et le plus excellent ouvrier, car à vray dire l'eminence de le mestier ne consiste qu'en une tromperie innocente et toute pleine d'entousiasme et de divin esprit, les poetes ont leurs inspirations dans la teste ou est la nerve poëtique, et les peintres au fin bout des doigts et à la pointe scarante du pinceau. Mais faut tromper l'œil ou tout n'y vaut rien : il faut qu'on croie que celà est creux et enfoncé, cela enflé, et boursofflé, cecy hors d'œuvres et qui se jette entièrement hors du

hollow and concave, that swollen and convex ; this appear to project and stand out from the picture, that must appear distant a good league ; this of a prodigious height, that perforated ; this living and full of movement. Let the horse gallop and foam at the mouth through its hard breathing ; let the dog bark loudly ; let the blood flow from the wound ; let the clouds really thunder and be torn to pieces by frequent flashes of lightning ; let this dying man appear with his soul issuing from his lips ; let this bird tire his beak by pecking at the grapes ; let the spectators call for the curtain to be raised, so as to see what is behind ; yet there is no reality in this, for the surface on which the objects are represented is flat, and truth is imitated so artfully that nature appears to have animated the picture in order to assist painting to deceive us, and to laugh at our folly ; hence it is that one painter wrote in his works "*res ipsa*"—*it is the thing itself*, not the imitation ; and another, "*fecit Apelles*," which that great artist wrote on three works in which he surpassed art, nature, and himself ; on the others he wrote "*faciebat*," that is to say, "*he was doing it*." He would not finish his designs lest he should make Nature blush, for she had already acknowledged herself conquered by genius and art,—not like those simpletons who were such fools as to paint an ox or an ass for a horse, and so wretchedly was the imitation daubed, that it was necessary to write under it in large letters, "Gentlemen, this is an ass ;" or, "Gentlemen, this is an ox ;" but even in this they lied, for there were two asses ; he [the painter] was the first, and the brute he had painted the second. Therefore, to know how to discourse on this noble profession, you must have frequented the studio and disputed with the masters, have seen the magic effects of the pencil, and the unerring judgment with which the details are worked out by the
of the wonders of nature by René François,
the King's preacher.

tableau, cecy esloigné d'une bonne lieue, cela d'une hauteesse extrême, celà perce à jour, cecy tout vif et plein de mouvement, que le cheval court et escume à force de souffler, que ce chien jappe vivement, que le sang coule de la plaie, que les nuées tonnent en effet, et que les nuages soient tout descousus à force d'esclaires qu'on voie sortir coup sur coup ; que cest homme rende l'esprit, et qu'on voie l'ame sur ses leuvres, que les oyseaux bequettent ces raisins, et se lassent le becque, qu'on crie haut qu'il faut oster le rideau afin de voir ce qui est caché, cependant il n'y a rien de tout celà, car tout celà est plat, pris bas mort et contrefait si artistement qu'il semble que la nature se soit couchée la-dessus pour aider la peinture à nous tromper finement et se mocquer de nostre bestise, de la vient qu'un deux escrit en les ouvrages *res ipsa*, c'est la chose même non pas la peinture, et l'autre *fecit Apelles* ; ce qu'il mit en trois piéces ou il surmonta l'art, la nature et soy-mesme, aux autres il mettait *faciebat*, c'est à dire il faisoit, et à dessein n'a point vouluz achever de peur de fair rougir la nature qui se fut confessée vaincue par l'esprit et par l'art, ce n'est pas comme ces badaux qui étaient si niaiz que pour peindre un cheval ils faisoient une asne ou un bœuf et encore si mal fagotté qu'il falloit escrire en gros cadeaux : Messieurs cecy est une asne, cecy est un bœuf, encore mentoient-ilz, car ilz estoient deux, luy le beau premier, et celuy qu'il avoit peint l'autre ; Pour scavoir donc parler de ce noble mestier, il faut avoir esté à la boutique disputé avec les maistres, veu le traint de pinceau, et le jugement assureé pour esplucher toute chose par le menu ¹ . . may des . . . merveilles de nature par René François Predicat. du Roy.

¹ The words omitted are illegible in the MS.

CHAPTER I.

OF FLAT PAINTING.

1. THE muller (that is, the stone with which the colours are ground) must be of flint or whetstone, so as to grind the colours on the porphyry and to incorporate them better with the oil. The amassette¹ is of horn, and with this the colours are collected after grinding, and spread upon the stone.

2. The scaffold or easel of the painter is used to support the paintings for working.

3. The pencils are made of a soft kind of hair, but which has sufficient resistance to keep itself straight, and to make a firm point for painting; the hairs of bears are very good, so are those of martens and similar animals. Small brushes made of hogs' or pigs' bristles are also used, and pencils of fishes' hair² for softening.

4. The pinceliere is a vase in which the pencils are cleaned with oil, and of the mixture of oil and dirty colours is made a grey colour, useful for certain purposes, such as to lay on the first coats, or to prime the canvas. The pincelier is a vase containing oil, in which the pencils are placed that they may not dry.

5. A palette set for painting flesh colour must contain terre verte, cendre verte et bleue, brown pink, yellow ochre, vermilion, red ochre, lake, umber, bone black, and charcoal black, with white lead in the middle.

6. The painter's palette is the mother of all colours; for, from the mixture of 3 or 4 principal colours, his pencil will create, and, as it were, cause to flourish all kinds of colours. They say to *set a palette* for the carnations (that is to say, to make the flesh colour), with green, &c.; and this is the work of the boy. The principal colours are, 1st, white lead (so called because it is found in lead mines); 2ndly, fine azure

¹ Amassette—instrument with which the colours are collected and scraped together on the stone.

CHAPITRE PREMIER.

DE LA PLATTE PEINTURE.

1. Il faut que la moulette soit de caillou (c'est à dire la pierre à broyer) de gré ou de queux, afin de mieux broyer les couleurs sur le porphir et les mieux incorporer avec l'huile. L'amassette est de corne, et amasse la couleur broyée, et éparse sur la pierre.

2. L'Estodi, l'eschafaux ou chevallet du peintre, c'est sur quoy on posse les tableaux pour travailler.

3. Les pinceaux sont fait d'un poil doux toutefois qu'il ait une résistance pour se tenir droit et faire une pointe assez ferme pour peindre, les poils d'ouris [ours] y sont tres bons, moustoil, foines et autres semblables ; on se sert aussi de petite bruisette fait de soye de pourceau (ou cochon). L'on a aussi des pinceaux fait de poil de poisson pour adoucir.

4. La pinceliere est un vase où l'on nestoie les pinceaux avec l'huile, et de ce meslange on fait un gris et bon à certains ouvrages comme à faire les premières couches ou imprimer la thoile. Le pincelier est un vase où l'on met tramper les pinceaux dans de l'huile, de peur qu'il ne se seichent.

5. Une palette de carnation est du verd de terre, cendre verd et bleuse, stil de grun [grain], ocre jaune, vermillon, ocre rouge, lac, terre d'ombre, noir dos et de charbon, avec blanc de plomb au milieu.

6. La palette du peintre est la mère de toutes les couleurs, car du meslange de trois ou quatre maistresse couleurs, son pinceau fait naistre et comme fleurir toutes sortes des couleurs, on dit préparer une palette de carnation (c'est à dire, pour faire la charnure) du verd, &c. Et c'est l'ouvrage du garçon. Les meres des couleurs sont premièrement le blanc de plomb (à cause qu'il se trouve en mine de plomb). 2 le fin azur et

² Probably seal's fur.

and ultramarine ; 3rdly, Venetian lake, which makes a most brilliant flesh colour and scarlet ; 4thly, Spanish vermilion ; 5thly, la cendrée ; 6thly, charcoal black ; 7thly, massicot, which serves for the fine yellow ; 8thly, “verd de terre ;” 9thly, dragon’s blood ; and, 10thly, “la rosette.”¹ These are the florid colours, the others are common.

7. The canvases are covered with parchment glue or flour paste before they are primed with potter’s earth, yellow earth, or ochre ground with linseed or nut oil. The priming is laid on the canvas with the knife or amassette to render it smoother, and this is the work of the boy.

8. To take the portrait of a person, or to draw from the life. Anciently, the art did not extend beyond drawing the outlines ; in later times the outline was covered with a single colour. To give expression and character ; to open the mouth, the eye ; to give a smile ; to paint the soul, the character, the passions, &c.

9. To paint the portrait after the life, to leave the work at the discretion of the pencil, and to the chance of the hand ; to heighten and relieve the colours, i. e. to give the colours lustre and light ; item to varnish, and cover with varnish to produce lustre.

10. Outlines, gestures, symmetry, proportions, expressions, and character, give renown to the pencil, and are the principal points to be aimed at. The inner part is easily done ; but the outline, the finishing touches, and the roundings off of the different objects are difficult.

11. To shade or shadow the works, put in the darks and shadows, to give prominence to some parts, and make others recede, and to throw back the landscapes to a still greater distance, and compress them into a small space. The light and shade should be intermixed so that the diversity of colour may heighten and give roundness to both.

¹ La Rosette. See Chap. VII. No. 11.

l'outremarin. 3^e. la lacque de Venise qui a un incarnat et une escarlatte fort vive. 4^e. le vermillon d'Espagne. 5^e. la cendrée, 6^e le noir de charbon, 7^e le massicot qui est le fin jaune, 8^e le verd de terre, 9^e le sang de dragon, 10^e la rosette : voilà les couleurs gayer, les autres sont rudes.

7. Les toilles s'encolles avec colle de parchemin ou de farine auparavant que les imprimer ; on les imprime avec terre de potier, terre jaune ou ocre broyés avec huile de noix ou de lin. La dite imprimure se couche sur les toilles avec un cousteau ou avec l'amassette pour les rendre plus unie, et c'est l'ouvrage du garçon.

8. Pourtraire et enlever au vif une personne, du commencement on ne faisoit que porfiller, puis après on couvrit le pourfil d'une seule couleur. Donner contenance, sans images et bonnes mines, ouvrant la bouche, l'œil, le rire, &c., peindre l'esprit, les mœurs, les passions, &c.

9. Faire le pourtrait au naturel, laisse l'ouvrage à la discretion du pinceau et au hasard de la main, rehausser les couleurs et relever l'ouvrage, c'est donner le lustre et le jour aux couleurs. item vernisser et coucher du vernis pour faire esclate.

10. Les pourfils, les gestes, les simmetries et proportions, et mines et bonnes contenance sont celles qui donnent bruit au pinceaux ; et le point principal de tout c'est cela. Le dedans se fait aisément, mais le pourfil, les derniers traits, et l'arrondissement de la besogne est mal aisée.

11. Ombre ou ombrager les ouvrages, faire des nuits, des ombrages pour faire esclate, les autres reculer, les paysages bien loin et en petit volume. L'ombragement et le jour s'entremeslent afin que la diversité des couleurs facent rehausser et arondir l'une et l'autre.

12. Besides the light and the shade, there is the half light,¹ which is something between light and shade, and is a colour composed of a mixture of the two, and is that which separates the colours; it is called "dejettement," and in Greek "ar-moge."

13. To paint landscapes on a flat ground in architecture, in the air, and as if among the clouds, covering but a small surface of canvas; the ancients had two sorts, and afterwards three, the Ionic, Sicyonic, and Attic. To make figures, flowers, fancy subjects, rivers, to raise mountains, and tempests, &c.

14. To paint landscapes, grotesques, arabesques, rustic scenes, fancies, chimeras, vignettes, tufts of trees, precipices, falls of water, sea pieces, storms, with a thousand poetical inventions of the kind.

15. To paint draperies, and clothe the figures, that is to say, to dress them with drapery, always using more than one colour, but there must be a mixture of colours. There is simple drapery, and there is drapery damasked and embroidered with historical subjects; there are robes tucked up and with folds, which the painters cover with crape, and which are visible through the veil and the transparent gauze; others which are broken with shadows in order to lower the brilliancy of the colours.

16. To lower the too great brilliancy of the colours with varnish, which is like talc or crape spread over the painting; to infuse into the painting the soul, the affections, the conceptions of genius (the inimitable invention of Apelles), in fact to paint that which cannot be painted, such as thunder, lightning, the voice, the breath, &c. To lay on the colours with cleanliness, with harshness.

17. Ceruse is made of lead and vinegar; it is good in the flesh colour and similar things. Burnt ivory, which was used

¹ Millin gives a different signification to this term. He says, that in painting a picture, it is said to be in a false light, when it is placed in an apartment in such a manner that the natural light enters on the side oppo-

12. Outre le jour et l'ombragement, il y a encore le faux-jour, qui tien du jour et de l'ombre et est un lustre composé des deux, ce qui sépare les couleurs, il s'appelle le "dejettemans" et en Grec "armoge."

13. Peindre en paysage, à fond plat, en architecture, en l'air, et comme parmi les nues, peindre en petit volume. Les anciens estoient à deux sortes et puis à trois, à l'Ionique, à la Sycionienne, et à l'Attique. Faire les personnages, les fantases, les fleurs, les fantasies, les rivières, dresser des montagnes, soulever des tempêtes, &c.

14. Peindre des paysages, des grotesques, arabesques, la rustique, des fantasies, et des chimères, vignetterment, touffe de bois, precipices, chutes d'eaux, baricanes, la marine, et les orages et mille gentillesses et inventions poétiques de la même taille.

15. Faire la draperie, et drapper l'image, c'est l'habiller or en drappant, jamais on ne met une seule couleur ; mais il y faut du meslange. Il y a simple drapperie ; il y a celle qui est damassée, historiée à brodure, les robes retroussées et les replis puisurés (*sic*), les feintres les couvertes de cresse, et qui percen le voile et la thuille desliée, les autres qui sont meurtries avec les ombrages qui rabattent le trop grand esclat.

16. Meurtrir la trop grande gayeté des couleurs avec vernix qui semble du talc ou du cresse ou de lairs espars sur le tableau ; l'ame, les affections, peindre les conceptions d'esprit sur le tableau (invention d'Appellée inimitable), enfin peindre ce qui ne se peut peindre, comme les tonnerres, esclairs, la voix, la respiration, &c. asseoir les couleurs proprement, estre trop rude à charge des couleurs.

17. La ceruse se fait de plomb et de vinaigre ; elle est bonne pour incarner playe et chose semblable ; l'isvoire bruslée fait un

site the artificial light which is supposed to illuminate the objects in the painting. Millin, Dict. des Beaux Arts.

by Apelles, is a most excellent black, for if it is dissolved in vinegar and dried in the sun it cannot be effaced. There are some works of powerful colouring, others feeble ; the latter, after the first painting, must be heightened with vigorous colours.

18. A good picture should possess great invention, well observed proportions, pleasing and natural colouring, lively flesh colour, rich drapery, distant landscape, accurate perspective, and tints so natural that the eye may easily be deceived.

19. The heightenings are produced by throwing lights upon them, the hollows and retiring parts are produced with the shades, and thick darkness must be surrounded with light. Softening is that tender union of the colours by which one colour is almost lost in the other. By glazing is meant the last thin coat [of transparent colour] which softens and gives brilliancy, by glazing the white, the purple, the green, the yellow, &c.

20. The painting should be placed in its proper light or in a full light, and concerning this you must know that all painting supposes generally that the light comes from the right towards the left ; the false light¹ is when the light shines from left to right, and in this case all the shadows are on the opposite side. Therefore, to place a painting in its proper light is to expose it to the light whence the painter supposes the light to come, turning it towards the window, so that all the parts may appear as if hidden behind that part of the body which is illuminated. It sometimes happens that the light falls from above ; when this is the case the head, face, and nose are highly illuminated, and the rest of the neck, body, and person do not participate in the light except in a few places where streaks or rays of light fall on the folds and other parts which appear to swell and project out of the work. Again, it sometimes happens in the opposite manner, when the light shines from below, and in

¹ This is now called *Faux jour*. See Millin, *Dictionnaire des Beaux Arts*.

noir excellent dont se servoit Apeles, car s'il est desmelé et defait en vinaigre, et ars au soleil, il ne se peut effacer. Il y a des ouvrages de haulte couleur, d'autre blaffarde, mais après la première couche il faut donner la charge avec quelques couleurs vigoureuse.

18. Un beau tableau doit avoir l'invention gaillarde, les proportions bien gardées, le coloris plaisant et naturel, la carnation vive, la draperie riche, les paysages fort éloigné, la perspective bien observée, la teinte si naturelle que l'œil soit aisément contraint d'estre trompé.

19. Les rehauts se font à force de jour qu'on verse dessus, les enfondremens, les creux, les rentremens, se font avec les ombres et les nuicts espaisées ceint de jour et de lumière. L'adoucissement se fait par une si douce liaison des couleurs qu'elle se perde quasi l'une dans l'autre, glace, c'est mettre les derniers adoucissements et la couche dernière delicate qui donne l'esclat avec le blanc glacé, ou pourpre glacé, verd glacé, jaune glacé, &c.

20. La peinture se doit mettre à son jour, ou estre à contre-jour ; surquoy il faut scavoir que tout peindre suppose d'ordinaire que le jour vienne du costé droite vers le gauche ; le contrejour, c'est la gauche à droicte, alors tous les ombrages sont du costé opposé donc le jour vient ; de façon que mettre une peinture à son jour, c'est la tourner vers le jour que le peindre suppose devoir estre le jour, à la tourner vers la fenestre en telle façon que tout les membres soient comme cachés derriere la partie du corps qui est enluminée. Il advient aussi que le jour se donne d'en hault, et a l'heure la teste, le visage, le nez, sont fort esclairez ; et le reste du col, du corps, et de la personne ne participes point du jour que par certains esclairs ou filet de jour qui esclate sur les replis et autres parties qui semblent s'enfler et se jeter hors l'ouvrage. Il y en a au contraire qui prennent le jour par en bas, et se doivent mettre bien hautes, alors les pieds, genoux, et autres parties bien éminentes sont fort esclaireés le

this case the figures would be raised very high, and the knees and other prominent parts would be strongly illuminated, while the face and other parts would be half eclipsed. The light must therefore always be suffered to enter on the side whence the painter supposes it to shine, that is to say, the shadows must never appear to be thrown towards the window.

21. In a painting there must be the point of sight, the vanishing point, the hollows and retirements of the members, the perspective, the receding and approaching parts, the feints and deceptions ; there is even the movement of the eyes, which, by a miracle of the pencil, are made to appear to be looking everywhere, which they never do in nature ; they even appear to be moved by the eyelids ; nothing is wanting to the figures but speech and life.

22. To take the proper light, or the false light, that is to say, the side light which the window affords the painter ; the feigned light from another source, like the light on the angel in the Nativity ; the full light, when the light shines on the front of the whole portrait, and in this case there is no shadow.

23. Foreshortening, retreating, or retiring, which causes some objects to appear distant. These parts must be painted tenderly, that is, with softness, for if the colours were too strong the objects would appear too near.

24. The shadows give roundness, the colours shade and give force to the work. The false light which appears where it should not ; a concealed light, such as that of a flambeau, a lamp.

25. Drapery. To cast the drapery and to drape the figures, to add the ornaments, that is to say, to imitate the embroidery, or to paint vases or flowers on the robes which are of gold or of "dorage," that is to say, like fine gold ; and there are several sorts of "dorage," according to the lightness or darkness of the colour.

26. To represent the death of a stag or other animal. To paint a landscape you must begin with the air, *i. e.*, where there are no clouds, that it [the landscape] may appear nearer, and

visage et autre partie sont a demy esclipez. Il faut donc toujours donner le jour du costé que le peintre le suppose et jamais le contrejour, c'est à dire ne tourner jamais les ombrages du costé de la fenestre.

21. Il y a au tableau le point de jour, le tiers point, les enfondremens, rentremens de membres, la perspective, les esloignemens, les aproches, les fintes et tromperies ; il y a mesme du mouvement des yeux par un miracle du pinceau qui fait que l'œil regarde de toute part, ce que la nature ne fit onque ; mesmes avec les paupières on fait remuer les yeux, il ne s'en faut rien que les images ne parlent et ne soient animées.

22. Prendre le droit jour ou le contre jour, c'est à dire le jour du costé que la fenestre le donne au peintre ; le jour feint qui se prend d'ailleurs, comme à la nativité la clarté de l'ange, un jour de pleine face c'est à dire qui donne à tout le pourtrait un jour de front ; et la il n'y a point d'ombre.

23. A racourcissement, rentrement, renfondrement, pour faire paroistre la peinture loing il faut que la chose soit peinte flouement, c'est à dire doucement, car si elle estoit rude et non pas floue, elle paroistroit de trop près.

24. Les ombrages font dejetter les couleurs ombrer et faire rude la besongne, faux-jour qui se fait ou il ne faut pas, clarté desrobée c'est une lampe, flambeau, &c.

25. Drapper, faire la draperie et faire le drap, faire l'enrichissement, c'est à dire feindre la broderie ou semer des corbettes, c'est à dire des vases ou fleurs sur les robes qui se font d'or, ou de cirage [dorage?], c'est à dire comme de l'or fein ; et il y a plusieurs sortes de cirages [dorages?] selon que la couleur est plus claire ou sombre.

26. Faire un atterrasement de cerf ou autre beste ; pour faire un paysage il faut commencer à peindre l'air, c'est à dire, ou il n'y a point de nuées, afin qu'il paroisse plus près et les autres

the rest behind. The foreground, that is, the ground which sustains the whole work, is to be painted with forcible colours.

27. To paint or represent a dark night pierced by a single ray of light; to round the figure, *i. e.*, to make it appear in relief, which is done by means of light and shade. “*Derober un jour*,” that is, to represent a rising or setting sun in a corner, behind a mountain or something similar, which gives light to the whole.

28. There are different kinds of light; the “*jour de droit fil*” is, when the light comes from the right side; “*jour caché ou dérobé*,” as when the sun is supposed to be behind a mountain, not yet throwing its golden rays on the surface of the earth, at the rising of Aurora, or when she has opened the gates of light to the beautiful son of Latona, to restore the agreeable day-light, and to show her golden wig to the habitants of this low universe, and this is called “*jour dérobé*.” “*Jour feint*” is a light at midnight, as in the Nativity of Our Lord; and “*faux jour*” is when one cannot discern whence the light proceeds.

29. Distance of the works, when they appear distant, the colours being faint. Deception is the perfection of the art, deceiving the eye, which imagines it sees what in fact it sees not. To paint with black and white, or in distemper, or with nut oil, which is the usual way, and the best, or in fresco.

30. To work with crayons or charcoal, to sketch, to outline, to make the first design, to draw a rough sketch, to put on the first touches, to make the rough outline with crayon, chalk, charcoal, plumbago, vermilion, or to draw on the paper with ink. To sketch the first thoughts on the canvas, then at leisure to search for perfection and particularize all the parts; to draw the subject, to rub out the false touches of the rough sketch; the “*maistre traict*” still remains to guide the sketched work.

31. To represent a full face, that is, all the face; thus—

[This part of the work is illustrated with drawings.]

32. To paint the outline or profile, *i. e.* the half or side face.

derrière. la terrasse est fort rude, c'est à dire, la terre qui soutien toute l'ouvrage.

27. Peindre ou faire une nuict épaisse trenchée d'un petit filet de jour desrobé : arrondir la figure, c'est à dire faire qu'elle semble de relief, et qui se fait par le jour et l'ombrage. Desrober un jour, c'est faire en un coin derrière une montagne ou autre chose un soleil qui porte le jour, qui se leve, ou qui se couche.

28. Il y a divers sortes de jour ; le jour de droit fil c'est quand on le fait venir du costé droit, jour caché ou desrobé comme par supposition que le soleil fut derrière une montagne, ne jetant encore ses rayons dorés sur la surface de la terre, au lever de l'Aurore ou quand elle a ouvert les portes du jour a ce beau fils de Latone pour rédonner les agréables clartés et faire voir sa perruque dorée aux habitans de ce bas univers, et s'appelle jour desrobé.

Jour feint c'est un jour en plain minuit, comme a la Nativité de Nostre Seigneur, et faux-jour, c'est quand on ne peut dicerner de quel costé il vient.

29. Esloignement des ouvrages quand ils semblent loing, estant flouée ; feindre, c'est le haut point de l'art, trompant l'œil qui croit voir ce qu'il ne voit pas. Peindre de blanc et noir, ou a destrampe, ou a huijle de noix, qui est l'ordinaire et la meilleure, ou a fresque.

30. Crayonner, charbonner, griffonner, porfiler ; jeter la première ordonnance, figuer grossement, jeter les premiers traicts, faire le griffonnement avec crayon, craye, charbon, mine de plomb, vermillon ou figuer sur le papier avec l'ancre, Jeter des premières pensées sur la toile, puis à loisir en rechercher la perfection et particularisant toutes les parties, retirer la chose pourtraicte, effacer les faulx traicts du griffonnement ; le maistre traict demeure tout jours pour guider la besongne esbauchée.

31. Peindre de front ou en face ou en plain ; c'est tout le visage ainsi.

32. Peindre de profil ou pourfil, c'est la moictié.

33. To paint back views, *i. e.* backwards, when only the hinder part is painted.

34. To paint with glories, as they paint saints.

35. By “*ordonnance*” and design are meant the first touches, for painting refers to the colours which are applied upon the portrait. The size of the picture may be increased or reduced to a small scale; it may be pricked and laid on the ground and outlines, and pounced with pounce. The design thus executed is called “*poncif*,” but it is the work of the apprentice.

36. The colouring is very forcible, the colours well arranged; the lights disposed in their proper places; the drapery well cast; the painter has a good touch, *i. e.* he paints the flesh well, *i. e.* the flesh colour of the face, hand, and foot, for the other part of the body is clothed.

37. Moresques are pencils or horns drawn round a painting, and they are made of gold on a ground of the colour of gold.

38. Grotesques, in addition to these, contain figures.

39. Arabesques consist of foliage and flowers.

39a. Estampes (engravings) are copper plates. The word comes from *estamper*, which signifies to print in Italian.

40. Cartouches are almost the same things, except that the “*quartouche*”¹ partakes of the grotesque.

41. Terms are figures which are placed under brackets or cornices, which they support by their heads, like pilasters; they have the form of human beings down to the waist, the lower part being shaped into columns or pillars.

41a. Busts or models are generally half-figures; such, generally, are portraits.

42. Cameos are figures composed of black and white or red, or some other colour.

43. The design of Michael Angelo, the colouring of Raf-

¹ Cartouches were ornaments of painting, sculpture, &c. They repre-

33. Peindre à dos c'est tout à rebours, quand on peint le derrière seulement.

34. Peindre en gloire, comme on fait les saints ou saintes.

35. On appelle ordonnance et dessein ces premiers traits, et pourtraire, car peindre c'est avec les couleurs qui surviennent dessus le pourtraict. Si on veut aggrandir on peut reduire le tout au petit pied, le piquant et l'appliquant sur son fonds, et le poncer avec la ponce, et ce dessein ainsi fait se nomme le poncif, mais c'est pour les apprentifs.

36. Le coloris est fort vif, les couleurs bien posées, et bien mises; les rehauts fait bien a propos, le drap bien drappé, le peintre touche bien c'est à dire fait bien la carnation du nud, c'est à dire de la face, de la main, du pied, car le reste est habillé.

37. Moresques sont des pinceaux et des cornets autour d'un tableau qui se font d'or sur l'or couleur.

38. Les Grotesques ont de plus de personnages.

39. Arabesques sont feuillages et fleurs.

39 a. Estampes sont tailles douces: ce mot vient d'estamper, qui signifie imprimer en Italien.

40. Cuiver (?) quarts touches sont quasi les mesmes choses, sinon que le quartouche participe de la grotesque.

41. Termes: ce sont figures que l'on mets sous trez ou poutres, ou sous corniches, les soutenans de la teste en guise de pillastres et portent visage d'hommes et de femmes et le corps jusques à la ceinture, le bas estant fait en forme de colonne et pillier.

41 a. Bustes ou modeles sont figures a demy, comme on fait d'ordinaire les pourtraicts.

42. Camaieux, ce sont figures faites de blanc et noir ou de rouge ou de quelqu'autre couleur.

43. Le profil de Michel-ange, le coloris de Raphael, l'invented scrolls of paper, rolled or twisted. Their principal use was for inscriptions. The word "cartouches" was derived from "charta."

faello, the invention and boldness of Parmigianino, and the night scenes of Bassano united, would present to an artist the beau ideal of good painters ; they constitute the four elements of a perfect painter.

CHAPTER II.

PAINTING IN DISTEMPER.

1. FOR painting in distemper without oil, the colours must be ground with water or glue ; gum is used for illuminating and giving lustre and brilliancy to the colours which are heightened and rendered gay by the gum ; just as varnish gives a beautiful lustre to oil paintings, serving as gauze and talc to defend them from the dust ; and as crystal, to give lustre and light to that which seems gloomy and eclipsed.

2. Painters use several colours in finishing the pictures and in painting in gum, oil, or water, without trituration, grinding, &c. We shall only mention in this place those which are used with water, viz., black from burnt stag-horns, Flanders black, black stone, and ink, which the dark tan colours approach very nearly in colour, and from which the paler tawny colours are far removed ; dark violet, Indigo, turnsol, the violet from logwood [?], distilled and boiled in vinegar ; the paste which is made of a little white mixed with the preceding colour ; blue, which has several degrees of price and vivacity, that which is called "blanchette" and "mourante;" light blue and sky-blue ; brown-red, common pure lake, the colour of armour, which is composed of this lake and saffron mixed with urine ; gamboge and lake made from [Brazil] wood, vermilion, pure vermilion, minium as common as blanchette and as that which is called "rouge-blanc ;" "laque blanchette forte," with or without ceruse, of the colour of flesh ; the carnations, composed of vermilion, lake, and white ; or of minium, vermilion, and white ; true flesh-colour ; the colour of dead flesh, gamboge, brown-pink,

tion et la hardiesse de Parmesan, et les nuicts de Bassan font un peintre l'idée des bons peintres; ce sont les quatre elemens d'un parfait peintre.

CHAPITRE SECOND.

PEINDRE À DESTRAMPE.

1. POUR travailler en destrampe et sans huyle il faut broyer les couleurs avec de l'eau ou de la colle, la gomme sert pour illuminer et donner l'esclat et le rayon aux couleurs qui s'esveillent et se rendent gaies à la faveur de la gosme, comme aussi le vernix donne un beau jour aux ouvrages en huyle, leur servant de cresse et de talc, pour le garantir de poussière, et de crystal pour donner lustre et tirer au jour ce qui semble morne et esclipsé.

2. Les peintres se servent de plusieurs couleurs pour achever leurs tableaux, et pour peindre en gomme, en huyle, et a l'eau, sans trituration et broyement, ou autrement. Se mete seulement icij celles dont ils usent à l'eau, à savoir, le noir de cerf bruslé, de flandre, et de pierre noir, et d'ancre, dont les tannez bruns approchent de bien pres, car le tannez mourant en est plus esloigné, et puis ils usent du violet noir, de l'inde, du tournesol : du violet de bois de perse distillé et cuit en vinaigre, du paste qui se fait d'un peu de blanc meslé avec le précédent : de l'azur qui a plusieurs degrez de prix et de vivacité, de celui que l'on appelle blanchette et mourante, du bleu blanc et celeste, du rouge brun, de la laque pure commune, de la couleur d'armure qui se compose de la dite laque et du safran avec l'urine, de la gomme goutte et de la laque couleur de bois, du vermillon, du vermillon pure, de la mine tant commune que blanchette, et de celle que l'on appelle rouge-blanc, de la lacque blanchette forte avec ou sans la céruse; de la couleur de chair; vermillonnée, composée de vermillon, de laque, et de blanc : de la mine, et vermillon, [et ?] blanc, de la vraye couleur

saffron, which is mixed with massicot, pale yellow, golden yellow, brown minium and "cendres," and the colour of dead leaves, sap-green, calcined [vitriol?] "du mourant;" sea-green and "du gay," saffron, green-yellow made from the berries of the buckthorn; distilled verdigris [?], green-blue and mountain-blue, terre verte, grey-brown, grey [made of] white and black, turnsol and white, and several other compositions; ceruse and Venice white, white lead, and chalk-white. I omit several other colours which are distilled and obtained from minerals and metals, as well as those used with oil, the different mixtures of which would fill a whole book.

3. Indigo mixed with orpiment makes a beautiful green for distemper.

4. Orpiment makes a beautiful yellow, and is good for "dorages."

5. The shadows are composed of white lead, vermilion, lake, umber mixed with flesh colour, that is to say, with divers colours,—yellow ochre, ochre de ru, that is, dark-coloured ochre, massicot, "verde doye," sea green.

6. Gold and silver of Germany, of Flanders, and of Paris, are also used with the colours, and in paintings with water colours; but it must be remarked, that, when gold is to be applied on wood, iron, or copper, it must first have two coats of white, and the gold must be polished with the tooth of a dog or wolf; and if it is to be laid on an oil ground, it must have one coat of white, two of red, and then one of gold colour: the gold is laid on this. As to the gold leaf, it is applied with a pencil of badger's hair, and with the cotton.

7. Illuminating is working on vellum with white of egg or gum to distemper the colours, and in painting on them, powdered gold (not leaf gold) must be used, and "azur d'Acre," that is to say, the finest which is brought with gold from the mines; this is ultramarine, and is brought from Spain and the Indies.

de chair, de la couleur de chair morte, de la gomme goutte, de la graine d'avignon, du saffran que l'on mesle avec le massicot, du jaune pasle et du dore, du minium brun et cendre et de la feuille morté, du verd de vessie, du calciné, du mourant, du verd de mer et du gay, du safrans, du verd jaune du composé avec la graine d'avignon : du distillé, du verd bleu et de montagne, du verd de terre ; du gris brun, du gris blanc et noir, du tournesol et blanc, et de plusieurs autres composés : du blanc de ceruse et de venise, du blanc de plomb, et du blanc de craye. Je laisse plusieurs autres couleurs qui sont distillées, et que l'on tire des minéraux et des métaux, et toutes celles qui sont à huille, dont les différentes compositions méritent un livre entier.

3. L'inde, meslée avec de l'orpin, fait un tres beau verd en destrampe.

4. L'orpin fait de très beau jaune, et est bon à faire des cirages [dorages?].

5. Blanc de plomb, vermillon, lacque, la terre d'ombre pour faire les ombrages meslé la carnation c'est à dire de diverses couleurs, l'ocre jaune, l'ocre dru [de rue] c'est à dire plus brun, massicot, verd doye, verd de mer.

6. L'on use aussi de l'or et de l'argent d'Allemagne, de flandres, et de Paris dans les couleurs et peintures à l'eau, mais il faut remarquer que l'or s'applique tellement sur le bois, sur le fer, et sur le cuivre, qu'il faut premièrement mettre deux couches de blanc sur le bois, et qu'il faut pollir l'or avec le dent de chien ou de loup : et si on le couche en huile il faut mettre une couche de blanc, deux de rouge, et puis l'or de couleur sur lequel on met l'or ; quant à l'or en feuille, on l'applique avec le pinceau fait de poil de blereau et avec le coton.

7. Enluminer c'est travailler sur du velin avec du blanc d'œuf qui destrampe les couleurs ou de la gomme, puis on peint avec de l'or moulu (non pas en feuille) et azur d'Acre c'est à dire le plus fin qui vient avec l'or dans la carrière c'est l'outremarin, on l'apporte d'Espagne,¹ ou des Indes.

¹ Pacheco, whose work was published only six years after the date of
VOL. II.

CHAPTER III.

FRESCO PAINTING.

FRESCO painting is the art of painting on the wall while the first coats [of plaster] are still damp, that the colours may be absorbed and penetrate into them. It is generally executed in distemper, and lasts twice as long as any other kind of painting. If the following conditions¹ are observed, it will withstand all weathers.

First. If the wall has not been plastered, you must apply three coats or beds composed of sand and old lime, the older the better. The first coat must be of coarse river sand, passed through a coarse sieve, and old lime, as we have said before,—7 parts of sand and 1 of lime.

The second coat must be of the same material, except that the sand should be finer, and the lime in less quantity, that is to say, the sand must be passed through a finer sieve. Distemper with milk of lime, which is made by putting old lime in a vessel with water, to reduce it as it were to a milk and clear broth.

The third coat must be composed of the same material, always diminishing the quantity of lime, and using sand of fine quality.

The three first coats should be whitened with the same milk [of lime]: in working, the tool must be passed from right to left, and afterwards from top to bottom, that all the holes may be filled; it must then be left a short time before working on it.

If the wall has already been fresh plastered, it will require but two beds or coats.

The pencils are made with tolerably coarse hogs' bristles.

this MS., says, p. 391, that Ultramarine was not used by the Spanish painters on account of the expense. The azure sent from Spain to Flanders or France, therefore, may have been the native blue carbonate of copper. In the Bolognese MS. it is identified with *Azzurro della Magna*, which has been proved to be the native blue carbonate of copper.

CHAPITRE TROIS.

POUR PEINDRE A FRESQUE.

PEINDRE à fresque ou à frais, c'est travailler sur l'aparoir les couches premières encore toutes fraîches afin que les couleurs s'imbibent et penetrent au dedans, et se fait d'ordinaire en destrampe, et s'y dure deux fois autant que d'autre. Ceste peinture tien bon contre tout temps.

Premier.—Si le mur n'est crespny nij réduit, faut faire trois couches ou lict avec sable ou chaux vielle, tant plus vielle elle est et tant mieux vaut. La première couche sera de gros sable de rivière, grossièrement passé, et de chaux vielle, comme dit est, les sept pars sable et la huitiesme chaux.

Le second lict sera de la mesme matière, sinon que le sable sera plus deliés, et la chaux en moindre quantité, c'est-à-dire le sable plus menu passé destrampe dans du lait de chaux, lequel se fait en mettant dans un pot de la chaux vielle et de l'eau, pour la reduire en laict et claire bouillye.

Le troisième lict sera encore composé de la mesme matière, diminuant toutjours la quantité de la chaux et affinant le sable.

Les trois couches premières seront blanchies du mesme laict, en tirant de gauche à droicte, et puis après de hault-à-bas, afin que tous les trous se remplissent, et fait on les laisse un peu reposer pour y travailler.

Sy le mur est jà recrespy, il n'y sera besoin que deux lict et couches.

Les pinceaux sont fait de soye de pourceau, et assez grossiers.

¹ This is the method of Father L'Ange and P. Antoine, the Capuchin. M. Thierson adopts the same method, as he himself informed me.—*Marginal note by Author.*

The colours are lime white and charcoal black (any kind of charcoal will do), and black stone, the one being blacker and the other browner, which last serves for the shadows.

This painting is done in distemper without oil, and the colours are clear and liquid as fluid ink.

The painting is executed while the above mentioned coats are still damp, by which the colours penetrate and are absorbed.

If the beds or coats should dry before the work is finished, they may be moistened by throwing over them three or four jugs of water.

The niches in which the figures are painted are generally red.

Under the beams may be placed "terms" or figures of the natural height, sustaining the beams with their hands and heads; these figures are generally painted red.

This kind of painting lasts nine or ten times longer than any other kind, and the more it is exposed to the rain the better it lasts.

The ancients used to practise this kind of painting very much, and the Italians still do so. In the ruins of ancient Rome some beautiful examples of it are found, which testify its durability.

When it is wished to represent a person, or some other figure, previous to laying on the coats of lime and sand, the design is to be drawn with charcoal or black earth, on several large sheets of paper glued together. The design having been drawn with charcoal made of the spindle tree, or of black chalk, the coats [of lime and sand] are then to be applied, and while these are still wet the niches and borders are drawn. When this is done, the paper containing the design is applied, and the principal lines having been pricked with a pin on to the niche, the designs are rubbed with the feathers of turkeys, or of some other bird. When the design is removed, the person or figure which was on it is found impressed on the plaster.

Les couleurs sont, scavoir, le blanc de la chaux, et le noir de charbon, il n'importe de quel bois et de pierre noire, l'un estant plus noir et l'autre plus brun, ce qui sert à faire les ombrages.

Ceste peinture se fait à destrampe sans huile, et sont les couleurs assez claires et liquides comme de lancre coulante.

La peinture se fait sur les dites couches encore fraîches par le moyen de quoy les couleurs s'imbibent et penetres au dedans.

Que si les couches et licts venaient a se seicher auparavant la perfection de l'ouvrage, on les rafraichit en jettant dessus trois ou quatre potées d'eau.

Les niches dans lesquels on peint les personnages sont ordinairement rouge.

Soulz les taz et poultres on y peut mettre des termes ou personnages de haulteur naturel soutenant à deux mains et de la teste les dites poultres ; et sont ordinairement de rouge.

La dite peinture dure neuf ou dix fois plus que l'autre, et tant plus elle est bastie des eaux pluviales tant mieux vault.

Les anciens se servoient fort de ceste peinture, et encore aujourdhuy les Italiens, il se rencontre dans les anciennes ruines de Rome des pieces de ceste peinture encore fort belles qui tesmoignent sa durée.

Lorsque l'on veult représenter un personnage ou quelque autre figure, on en fait le dessein auparavant que faire les dites couches, sur plusieurs grandes feuilles de papier collée ensemble. Ce dict dessein fait de noir de charbon de fusain ou pierre noir, puis on fait les couches et icelles estant fraîches on y fait les niches et les bordures et filets, cela estant fait on applique le papier portant le dessein piquetté et percé avec une espingle de principaux traicts dans la niche, puis avec plumes de coq d'Inde oisaux ou aultre on frotte le dit dessein, lequel estant osté, le personnage ou la figure portée en icelluy se trouve imprimée sur les couches.

The back of the design is applied against the said fresh plaster ; and, as only the principal lines are marked, the design is fixed upon boards near the painter, that he may imitate it in finishing, perfecting, and shading the pierced drawing.

Gypsum is of no use for making the plaster, for it swells and decays when exposed to the rain.

CHAPTER IV.

PEINTURE D'APREST—(PAINTING ON GLASS).

A "BEL APREST" is a painting executed on glass, baked and re-baked in the fire with colours that can stand the fire, such as the mineral colours.

1. To make good black for drawing the outlines on the pieces of glass, you must take equal parts of clean scales of iron and rocaille;¹ grind them on a plate of copper for five hours with a little urine.

2. You must provide some crow-quills for writing^a and for drawing on the glass, for they are more delicate and firm than other quills.

3. You must draw the figures as delicately as possible, keeping them very clean ; and whilst drawing them, be careful not to touch the surface of the glass with the fingers,^b for that would injure it, but you must take the glass by the edges, and then leave it to dry.

4. The glass being dry, you must have a pencil with a brush at each end, which is used for washing and shading the figures.

5. The colours are to be applied smoothly on the figures which have been previously drawn ; and when they are dry

¹ Rocaïlle—The white glass or flux to which different minerals were added for the composition of the various coloured glasses used for painting.

Le dos du dessein s'applique contre les dites couches fraiches ; et, d'aultant qu'il n'y a que les principaux traicts de ponces, on met le dict dessein dessus une esse [ais] pres de soy pour l'imiter en ragreant, perfectionnant, et baillant les ombrages au poncif.

Le plastre ne vaut rien à faire les couches, d'aultant qu'il renfle et se pourrit à la pluie.

CHAPITRE IV.

POUR TRAVAILLER D'APREST.

UN bel aprest c'est une peinture faite sur le verre cuite et recuite au feu avec des couleurs qui puissent souffrir le feu comme sont les mineralles.

1. Pour faire son noir pour rétirer les oualles, il faut prendre des escailles de fer des plus nettes et de la rocaille, autant de l'un que de l'autre ; et les broyer l'espace de cinq heures sur une platine de cuivre avec un peu d'urine.

2. Il faut avoir des plumes de corbeau pour escrire et retirer les oualles, car elle sont plus délicate et ferme que d'autre.

3. Il faut retirer des figures le plus délicatement que l'on peut, et les tenir tousjours nettes ; et en les maniant, ne mettre jamais les doigts dessus, car cela y nuict, mais il les faut prendre par les costés, puis il les faut laisser seicher.

4. Les oualles estant seiches, on a un pinceau émanché par les deux boutz, duquel on se sert pour laver ses figures et leur donner les ombrages.

5. L'on couche les couleurs tout unie sur les figures qu'on a retirés auparavant, puis quand elles sont seiches on a un pin-

Le Vieil says the best kind of rocaille was brought from Venice. See Le Vieil, "L'Art de la Peinture sur Verre," p. 106.

² To write on glass—the technical expression for painting on glass.

³ Le Vieil says that during the drawing, the glass should be covered with a sheet of white paper.

you must take a very hard pencil of hogs' bristles, with which the figures are scratched where lights are required, so as to remove the colour and leave the glass white.

6. Observe, that the under layer of colours must be dry before laying on more colour.

7. The secret of this kind of painting consists in making the black properly. It is said the addition of a little urine does everything when it is neither in too great nor too small quantity.

8. The figures are to be much softened (or shaded) with grey before colouring them, then the colours are glazed smoothly upon this.

9. The yellow is made with silver, copper, and a little yellow ochre, the whole ground up together on a plate of copper.

10. The furnace must be heated for 12 whole hours, first with a small charcoal fire for 4 hours, the heat being gradually increased ; then for the last four hours the furnace must be strongly heated. But take care to remove the charcoal frequently for fear of burning the pieces of glass which are underneath, and heat the furnace so that the fire does not smoke, for this spoils the work ; but make a clear and strong fire.

11. The pieces of glass are to be placed on a pan of iron on an iron tripod or fillet, just in the middle of the fire, so that the flame rises all round it without injuring them.

12. Beds or layers of lime are laid between the pieces of glass above and below, that they may not break.

13. You must provide some pieces of glass for experiments, which may be withdrawn from the fire in order to ascertain whether the colours are sufficiently baked.

14. These are the principal points to be observed in this art, for, as regards the outline, one cannot fail in this on account of the design which is placed under the glass, the outlines of which have been traced as delicately as possible with black as has been before observed.

ceau de soye de pourceau fort rude, avec lequel on grate ses figures a l'endroit qu'il faut les jours, pour les emporter et laisser le verre blanc.

6. Notté, qu'il faut que les couleurs de desoubz soient seiches auparavant que d'en remettre une autre dessus.

7. Le secret de ceste peinture est quand le noir est bien fait, un peu d'urine comme dit est fait tout quand il n'y en a trop n'y trop peu.

8. L'on adoucit fort ses figures avec un gri auparavant que les colorer, puis les couleurs se glassent par dessus tout unie.

9. Le jaune se fait avec de l'argent, du cuivre, et un peu d'ocre jaune, le tout broyez ensemble sur une platine de cuivre.

10. Il faut chauffer le fourneau douze heures entières, premièrement à petit feu de charbon quatre heures, puis en augmentant tousjours, les quatres dernières heures il le faut chauffer avec des esclat, et avoir soin de retirer souvent le braise de peure de brusler les oualles de desoubz, et le chauffer si bien que le feu ne face point de fumée, car elle gaste l'ouvrage, mais un feu clair et flambant.

11. On met les oualles dans une poille de ferre sur un trepied ou bande de fer justement au milieu du feu, de sorte que la flamme tourne tout autour sans endommager les oualles.

12. On fait des lictz et couches de chaux entre les oualles dessus et dessous de peur qu'elle ne se cassent.

13. L'on a des essais que l'on retire pour veoir si elle sont assez cuites.

14. Voila les principaux poincts de ceste sciences, car pour ce qui est du crayon, l'on ni peut manquer par le moien du dessein qu'on a dessous ses oualles, duquel on en fait le porfil avec du noir comme dit est le plus delicatement qu'il est possible.

15. As for the colours, there are works which teach the manner of composing them, but practice and experience do a great deal.

CHAPTER V.

OF THE PROPORTIONS OF THE HUMAN BODY.

PYTHAGORAS was right when he said that man was the measure of all things—first, because he is the most perfect of all corporeal creatures, and according to the maxim of philosophers that which is the most perfect and first of its class is the measure for all the rest; second, because in reality the common measures of the foot, the inch, the cubit, the pace, have taken their names and length from the human body; third, because the symmetry and well fitting of the parts is so admirable that all well-proportioned works, and especially buildings, temples, ships, columns, and similar pieces of architecture, are in some degree composed according to the proportions of man; we know that the ark of Noah, built by the command of God, was 300 cubits in length, 50 in breadth, and 30 in height or depth, so that its length was 6 times its breadth and 10 times its depth. Now let a man lie down at full length, and he will be found to have the same proportions as to length, breadth, and depth.

Villalpandus, speaking of that inimitable chef-d'œuvre and model of good architecture, the temple of Solomon, has curiously remarked the same proportion in certain parts, and also by means of this he has observed such rare symmetry throughout the whole work, that he has dared to assure us that from a single part of this large building, such as a base or a capital of a column, one might calculate the measures of this beautiful edifice.

Other architects tell us that the foundations of houses and the bases of columns are like the feet; the capitals, the roofs, and copings are like the head, and the rest of the building

15. Pour les couleurs, l'on a des recueils qui enseignent la manière de les composer ; la pratique et l'expérience y font de beaucoup.

CHAPITRE V.

DE LA PROPORTION DU CORPS HUMAIN.

PROTAGORAS avoit raison de dire que l'homme est la mesure de toutes choses, 1^o parce qu'il est le plus parfait entre tous les creatures corporelles, et selon la maxime des philosophes ce qui est le plus parfait et le premier en son rang, mesure tout le reste, 2^o parcequ'en effet les mesures ordinaires de pied, de pouce, de coudées, de pas, ont pris leur noms et leur grandeur du corps humain, 3^o parceque la symetrie et bien seans de ces parties est si admirable que toutes les ouvrages bien proportionnés, et nommément des bastimens, des temples, des navires, des colonnes, et semblables pieces d'architecture, sont en quelque façon composée selon ses proportions ; nous scavons que l'arche de Noé, bastie par le commandement de Dieu, estoit longue de 300 coudées, large de 50, et haulte ou profonde de 30, tellement que la longueur contenoit six fois la largeur et dix fois la profondeur. Or, qu'on couche un homme de son long, on trouvera la mesme proportion en sa longueur, largeur, et profondeur.

Villapande, traitant du temple de Salomon, ce chef-d'œuvre inimitable et modèle de toute bonne architecture, a remarqué curieusement en certaines pièces la mesme proportion, et par ce moien en tout le gros de l'ouvrage, une symmetrie si rare qu'il a bien osé asseurer que d'une seule partie de ce grand bastiment, d'une base ou d'un chapiteau de quelque colonne, on pouvoit coignoistre les mesures de ce bel édifice.

Les autres architectes nous advisent que les fondemens des maisons et les bases des colonnes sont comme le pied ; les chapiteaux, les toicts et couronnement, comme la teste, le reste comme

like the body. There is also similarity as well in form as in name, and those who have been rather more curious have remarked that, as in the human body, the single parts, such as the nose, the mouth, are in the centre; the others, which are double, are placed on the sides; so the same order is observed in architecture. Indeed, some have made researches more curious than solid, assimilating all the ornaments of a cornice to the parts of the face, to the forehead, eyes, nose, and mouth; comparing the volutes of the capitals to the flowing of the hair, and the flutings of the columns to the folds in the dresses of ladies; indeed, so many resemblances do they find, that it would really seem that as art imitates nature, so the building being the most artistical of all works, should be imitated from the chef-d'œuvre of nature, which is man, for the body of man is to other works what the statue of Polycletus was to other statues, which gave the rule to all others. It is for this reason that Vitruvius (book v.), and all the best architects, treat of the proportions of man, and among others Albert Dürer has written a whole work on the subject, measuring him from the foot to the head, whether he is taken in face or in profile, down to the smallest parts.

[*The proportions of the human figure, inserted at this place in the original, being well known, are omitted.*]

Knowing the proportions of man, it is easy for painters, statuary, and image makers to proportion and perfect their works, and by these means is rendered credible what some have related of Grecian statuary, viz., that some of these having one day undertaken that each should form separately a part of the face of a man, the different parts were afterwards conjoined, and formed a beautiful and well-proportioned face. It is certain that from knowing the proportions one may know Hercules by his footsteps, the lion by his claw, the giant by his thumb, and the whole of a man by a sample of his body. It was thus that Pythagoras, having measured the foot of Her-

le corps. Il y a de la convenance aussi bien en effet qu'au surnom, et ceux qui ont été un peu plus curieux ont encore remarqué que, comme au corps humain, les parties qui sont uniques comme le nez, la bouche, le nombril, sont au milieu ; les autres, qui sont doubles, sont mises de costé, et d'autre avec une parfaite esgalité, de mesme en architecture. Voire mesme quelqueuns ont fait des recherches plus curieuses que solides, apparians tous les ornements d'une corniche aux parties de la face au front, aux yeux, au nez, à la bouche, comparant les volutes des chapiteaux aux cheveux entortillez et les cavelures des colonnes aux plis de la robe des dames, tant y a qu'il semble avec raison que comme l'art imite la nature, le bastiment estant l'œuvre le plus artiste, devoit prendre son imitation du chef-d'œuvre de nature, qui est l'homme, de façon que son corps en comparaison des ouvrages, est comme la statue de Polyclète, qui regloit toutes les autres.

C'est pourquoi Vitruve, (liv. v.) et tous les meilleurs architectes, traictent des proportions de l'homme, et entre autre Albert Durer en a fait un livre entier, le mesurant depuis le pied jusqu'à la teste, soit qu'on le prenne de front ou de profil, jusques au moindre parties.

* * * * *

Sachant les proportions de l'homme, il est facile aux peintres statuaires et imagères (?) de proportionner et perfectionner leurs ouvrages ; et par le mesme moien est rendu croyable ce que quelques uns racontes des statuaires de Grece qu'ayant un jour entrepris de former chacun a part et en divers une partie de la face d'un homme toutes les parties estant puis après assemblées, la face se trouva très belle et bien proportionnée. C'est chose claire que la faveur des proportions on peut cognoistre Hercule par ses pas, le lyon par son ongle, le geant par son poulce, et tout un homme par un eschantillon de son corps. Car c'est ainsi que Pithagore ayant pris la grandeur du pied

cules, according to the impression which he had left on the earth, was enabled to calculate his height; it was thus that Phidias from the claw of a lion could represent the whole animal conformable to its prototype; and finally, it was thus that the painter Timanthes having represented some pigmies who were measuring with a fathom line the thumb of a giant, could give a good idea of his size.

CHAPTER VI.

OF THE BEAUTY OF THE FACE.

THE beauty of the face consists in a forehead large, square, open, clear, and serene; the eyebrows being well-arranged, fine, and separated; the eye well opened, gay, and brilliant; the nose , the mouth small; the lips coralline; the chin short and forked; the cheeks full and dimpled, the ear round and well turned; and the whole combined with a clear, fair, and smooth complexion.

There are several points to be considered with regard to beauty. The beauty of man properly consists in the form and size of his body: the other kinds of beauty are for women; there are two kinds of beauty—one still, which does not move, and which consists in the due proportion and colour of the limbs, the body not being puffed or swollen, the sinews not visible nor the bones piercing the skin, but the body full of blood, vigorous, and plump, the muscles raised, the skin polished, the colour vermilion. The other kind is moving and is called grace, consisting in the movement of the limbs, and especially of the eyes; one kind is as it were dead, the other living and acting; there is rude, fiery, and severe beauty, and there is soft beauty as well as insipid beauty.

Beauty described.

1. The skin of the whole body like jasper or porphyry, interrupted by small and graceful azure veins.

d'Hercule suivant les traces qu'il en avoit laissées sur la terre colligea tout sa hauteur, c'est ainsi que Phydias ayant seulement l'ongle d'un lyon figura toute la beste entierement conformes a son prototype. Ainsi le peintre Timante ayant peint des pigmées qui mesuroient avec une toise le pouce d'un géant donne suffisamment a cognoistre la grandeur du géant.

CHAPITRE VI.

DE LA BEAUTÉ DU VISAGE.

LA beauté du visage¹ gist en un front large, quarré, tendu, clair et serain, sourcils bien ranges menu et deliés, l'œil bien fendu gay et brillant, nez bien , bouche petite aux levres corallines, menton court et fourchu, joues relevées et au milieu le plaisant gelasin, oreille ronde et bien troussée, le tout avec un teint vif, blanc, et vernie.

Il y a diverses considerations en la beauté ; celle des hommes est proprement la forme et la taille du corps, les autres beautés sont pour les femmes, il y a deux sortes de beauté ; l'une arrestée qui ne se remue point et est en la proportion et couleur deus des membres, un corps qui ne soit enflé ny bouffy, auquel d'ailleurs les nerfs ne paroissent point, ni les os ne percent la peau, mais plain de sang, d'esprits et enbonpoint ayant les muscles releves, le cuir poli, la couleur vermeille ; l'autre mouvante, qui s'appelle grace, qui est la conduite des mouvemens des membres, surtout des yeux ; celle là seule est comme morte, celle cy est agente et vivante ; il y a de beautés rudes, fières, aigres ; d'autre douces voir encore fades.

De la beauté descrite en dix-huict articles.

1. La peau de tout le corps comme jasse ou porphyre, entrecoupée de petites veines azurées trenchant de bonne grace, c'est y voir mouvant.

¹ Lecaron—L. de la sagesse.—*Marginal note by Author.*

2. The hair flaxen, golden, and curling naturally.
3. The forehead gently arched, serene like the sky, polished like alabaster.
4. Two eyes on a level with the head, large, sparkling, and beaming mildly.
5. The eyebrows black, fine, well arranged, and arched.

6. The cheeks like lilies and roses, indented by two dimples.

7. The mouth flesh-coloured, and like pinks or coral.
8. Oriental pearls or diamonds, set in the scarlet gums, even, all of the same size, close, not pressed together, and not yellowish.
9. The chin round and dimpled, not pointed or flat, or creased.
10. The whole complexion soft and smooth, without wrinkles or creases.
11. The neck like snow or coagulated milk, beautifully round and of proper size.
12. The temples well filled up, not deep and hollow.
13. The cheeks not sunken, hollow, pendent, or withered, but slightly raised, without, however, being too much swollen or puffed.
14. The profile of the nose aquiline, dividing the face into two equal parts.
15. The ears small, vermilion, close, and in no wise torn or drooping, or deeply marked.
16. The head well rounded and proportioned to the other parts of the body, neither too small and thin, nor too long and pointed.
17. The colour lively and fresh, and neither too red nor of a pale saffron colour, nor with similar defects of complexion.
18. The deportment grave, or gay without affectation or art, full of simple sweetness.

2. Cheveux blond, doréz et frisez par nature fort naïfs.
3. Le front mollement vouté, serain comme un ciel, polly comme albastre.
4. Deux yeux a fleur de teste, estincelant, d'une belle grandeur et doucement rayonnant.
5. Les sourcis de brins d'ébene fort menus, bien arrangez, et ayencez en façon d'arc.
6. Les joues comme de lys et de roses entasmées de deux fossettes.
7. La bouche incarnadine, et d'œillets ou de corail.
8. Des perles orientales ou diamans enchassez dans l'escarlatte des gencives, et tout a l'esgal, et de mesme grandeur, non entrouvertes, n'y entrebassantes, ny jaunissantes.¹
9. Le menton rond et fosselu, non pointu, ny applaty, ny fendu.
10. Tout le teint uny et delié sans estre detranche de rides, ny fendu de sillons.
11. Le col de neige ou de laict caillé d'une belle rondeur et grandeur proportionnée.
12. Les temples bien remplies, et non enfoncées et creuses.
13. Les joues non point abbatues, effamées, deschargées, pendantes ou flestries, mais doucement enflées sans estre pourtant trop bouffies et boursoufflées.
14. Le nez aquilin a pourfil, et fendant a droicture le visage party esgallement.
15. Les oreilles petites, vermeilles, fermées et nulement arachées ou languissantes, et trop avallées.
16. La teste bien arrondie, d'une grosseur avenante au reste du corps, non trop menue ni mince, ny trop longue et pointue.
17. La couleur vive et animée sans excez de rougeur, de pasle couleur de safran ou pareille ternissure de visage.
18. Le maintien grave, gay sans feintes et artifices, plein de naïfve douceur.

¹ P. Binet, 'Essay de Nature.'

CHAPTER VII.

OF COLOURS.

1. COLOURS [pigments] are formed in the earth and in mines, or are composed by mixtures and combination, or are extracted from herbs or otherwise.

2. Black is made either with the soot and smoke of resin or with vine twigs and shavings of pine, reduced to charcoal, pounded, and mixed with glue, or finally, with the burnt lees of good wine, dried and mixed with glue. This is very black, and imitates the Indian colour which is called "morée."¹

3.² "Ceruleé," which is called blue or "turquin," is made by grinding sand with flower of nitre until it becomes as fine as flour. Some brass filings are then sprinkled over it and incorporated with the other ingredients; the whole is then made into pellets and ground between the hands, then placed in a furnace; the brass and sand then mix, from the heat of the fire, change their nature, and are reduced to a blue colour.

4. "Bruslé" is made of "mottée de sil"³ heated, and extinguished in vinegar, thus forming a purple colour.

5. Ceruse or white lead is made by putting vine branches in butts, pouring vinegar on to them, fixing sheets of lead on the top, and fastening them up air-tight; then, after some time the ceruse will be found attached. If it be heated in a furnace, its colour will be changed, and it will be converted into "sanda-racque" or massicot. When plates of copper or brass are attached in the same manner verdigris is made.

6. Ochre-coloured earth being taken from the veins of marble, when burnt and extinguished in vinegar, assumes the appear-

¹ Probably Indian ink.

² A marginal note states that this recipe was extracted from the "Essay de Nature." This pigment is the Vestorian Azure of Vitruvius, the Azzurro di Pozzuoli and Smaltino of the Italian writers; the term *turquin* —turchino, evidently shows its Italian origin.

CHAPITRE VII.

DES COULEURS.

1. Les couleurs se concrètent en la terre et en miniers, ou bien se composent par mixtions et températures, ou naissent en herbe ou autrement.

2. Le noir se fait ou de suye et fumée de poix raisine, ou de sarment de vigne et coipeau de pin, redigez en charbon pilez et meslez avec la colle, ou enfin de lie de bon vin bruslée, sechée et meslée avec la colle, celà devient fort noire, et imite la couleur d'Inde, qu'on nomme morée.

3. La cerulée qu'on nomme bleu ou turquin, se fait broyant du sable avec la fleur de nitre, si delie qu'il devient comme farine, on prend de la limaille d'airain de Cypre et en saupoudre en cela afin de s'incorporer, on moule des pélottes entre ses mains, on les mets dans un vaisseau et dans une fournaise, l'airain et le sable par la force du feu s'entredonnant leurs sueurs, changent de nature, et se reduisent en couleur cerulée.

4. Le bruslé se fait de mottée de sil, embrassées et destainteés en vinaigre, d'ou se fait la couleur de pourpre.

5. La ceruse ou blanc de plomb se fait mettant des branches des sarmens dans des tonneaux, les surfondant avec du vinaigre, et par dessus asseans des lames de plomb estoupant les queuelles afin qu'il ne sort ny vent ny halene, au bout de quelque temps on trouve la ceruse atachée. Si on la cuit en une fournaise, elle change de couleur et se convertit en sandaracque ou massicot, et quand on assied les lames de cuyvre ou dayrain ils en font du verdegris.

6. Le sil qui s'approche de l'ocre estant tiré des veines de marbres si on le brusle et esteind en vinaigre il prend semblance

³ The "mottée di sil" here mentioned is stone ochre. *Motte* or *Mote* signifies a stone, *gleba*. The term "sil" denotes a mineral earth of which colours are made; it appears to be always applied to iron ores.

ance of purple or crimson inclining to violet ; some think it is ultramarine azure.

7. "Rubricks," or "bloodstones,"¹ are also taken out of the earth ; orpiment, cinnabar, green chalk, or "verd de terre,"—that brought from Smyrna is the best. "Sandaraque," which some think is massicot, comes from Pontus, and in some places it is found ready prepared by nature, without the necessity of grinding, sifting, or pounding.²

8. Minium is made of lead melted in an earthen vessel over the fire, and stirred with a stick until the whole is changed into minium, which is found attached to the sides of the vessel.

9. *Indigo*³ is made with the flowers of woad ; that is to say, the flower and starch mixed with urine and vinegar ; then made into pellets, and dried in the sun.

10. "Verdet"⁴ is made of brass or copper filings, sprinkled with urine and sal ammoniac, then dried in the sun on a board, and sprinkled [with the same] until they become green.

11. The "rosette" is made with brazil wood boiled over the fire with "grain" [grana, or kermes] and gum ; and, if a light red is desired, pulverized alum is added.

12. Rose-colour is made with very small chips of brazil wood mixed with ceruse and roche alum, the whole distempered together, then covered with urine, and left in this state for some time ; it is then strained through a cloth, put into a glazed vessel, and placed in a dark situation to dry.

13. Purpurino is made with fine molten brass mixed with mercury, and made into a paste ; sulphur and sal ammoniac, which have been well ground in a wooden mortar, is then taken,

¹ Hæmatites, or red ores of Iron. The Lapis Amatito of Cennino and other old writers.

² Native red orpiment is plainly alluded to in this last sentence.

³ A marginal note shows that this definition was extracted from the work of D. Alessio Piemontese.

⁴ Verdetto. Baldinucci says this is a mineral colour produced in the mines

de pourpre ou cramoisi violet ; aucuns pensent que c'est l'azur d'outremer.

7. Les rubriques ou pierres sanguines se tirent aussi de la terre ; l'orpiment, le cinnabre, la craye verte ou verd de terre vient de la terre de Smyrne et est la plus excellente. La sandracque qu'aucuns croyent estre le massicot, vient du pont et croit en certains lieux toute préparée par nature sans qu'il la faille moudre, cribler, sasser, ny piler.

8. La mine se fait avec du plomb que l'on met fondre dans une vaisselle de terre sur le feu, en le remuant avec un baston jusque à ce qu'il soit tout converti en mine, laquelle on trouve attachée autour du pot.

9. L'Inde se fait avec fleurs de pastel ou gueste, c'est a sca-voir, florée et farine d'amidon meslée avec urine et vinaigre ; puis on en fait des pelottes que l'on met seicher au soleil.

10. Le verdet se fait avec airain et cuijvre limé, arousé d'urine vielle et sel armoniac, puis seiché au soleil sur un ais et s'arrouse jusque a ce qu'il vienne verd.

11. On fait la rosette avec bresil que l'on met bouillir sur le feu avec graind et gomme ; si on veut avoir un rouge leger, on y adjouste de l'alun pulverisé.

12. La rose se fait avec bresil derompu bien menu, meslé avec ceruse et alun de roche, le tout destrempé ensemble, puis on verse dessus de l'urine tant que tout soit couvert, et ainsi on la laisse une espace de temps après, il la faut couler par un linge et la mettre en un pot plombé en un lieu ou il n'y entre ny soleil ny clarté, et la laisser ainsi seicher.

13. La couleur purpurine se fait avec fin estain fondu, et argent vif meslé ensemble, et en fait on une paste, puis on prend soulfre et sel armoniac très bien broyez en un mortier de bois,

of Germany. It cannot then have been synonymous with the colour mentioned in the text, which corresponds in some measure with the *Verdete* of the Spanish writers, which is verdigris. Neither does it correspond with the *Verdetto* of Lomazzo and the Paduan MS., which is a kind of Brown Pink.

and the whole is incorporated together and put into a luted phial in the furnace over a slow fire ; a gold-coloured yellow is thus obtained.

14. Common lake is made by putting some cuttings of fine scarlet [cloth]¹ into a strong ley, which is boiled until the whole is dissolved ; some roche alum is then added, and it is passed through a bag, adding to it some raspings of brazil wood and gum arabic, mixing all these ingredients together, and then making them into small pellets, which must be suffered to dry.

15. Fine lake is made like common lake, except that no brazil wood is added.²

16. Cinnabar or vermilion is made of sulphur and mercury ground together on the porphyry, then burnt in the furnace until they are sublimed.

17. Azure is made by pulverizing mercury, sal ammoniac, and sulphur, and then burning them in an alembic.

18. Ultramarine is made with calcined silver, aquafortis, and sal ammoniac ; these are placed for some time in a well-closed leaden vessel.

19. The modern mode of making verdigris is to take some clean scales of copper, common salt, tartar of red wine, sal ammoniac, and leaven of wheat, distempered with vinegar ; the whole is then to be put into a glass vessel, and covered with dung for a certain time.

20. "Rouget" is made with bruised brazil wood, lime water, and roche alum, all boiled together.

21. Sap-green is made with the bruised fruit of the buckthorn, which is boiled in a new pipkin with pounded roche alum, then left to stand in a warm place for 6 or 8 days ; it is afterwards put in a bladder, so that no air may have access to it. Sometimes a little Spanish blue is used.

22. "Stil de grain" is made with [white] earth mixed with the juice of the flowers.³

¹ The cuttings of fine scarlet cloth were dyed with grana (kermes).

² This is Lacca di Cimatura of the Italians.

³ The words " fleur de geneste" are written in the margin of the MS.,

on incorpore le tout ensemble, puis se met en une fiolle lutée sur le fourneau a petit feu, ainsi l'on a un jaune qui imite la couleur d'or.

14. La grosse lacque se fait mettant de la tondure de fine escarlate dans de la forte lessive, que l'on fait bouillir tant qu'elle soit dissoulde en eau, on y met de l'alun de roche, puis on la passe dans un sachet, en y ajoustant bresil racle et gomme arabiques, le tout meslé ensemble, puis on en fait des petites pommes qu'on laisse seicher.

15. La fine lacque se fait ainsi que la grosse, sinon qu'on n'y met pas de brésil.

16. Le Sinabre ou vermillon est composé de soufre et mercure broyé sur le porphir, puis bruslé au fourneau à sublimer.

17. L'azur se fait avec sel armoniac, soufre, et mercure, le tout pulverisé [et] bruslé en l'alembic.

18. L'outremarin se fait avec argent calciné, eaue forte et sel armoniac qu'on met en un pot plombé tres-bien bouché quelque temps.

19. Le verdegriis à la moderne se fait avec escaille de cuivre bien nettoyée, de pouldre, sel comun, tartre de vin rouge, sel armoniac, levain de froment, le tout destrempé en vin aigre, ainsi se met dans un pot verre soub le fumier un certain temps.

20. Le rouget se fait avec bresil brisé, eau de chaux, allun de roche, le tout bouillé ensemble.

21. Le ver de vessie se fait avec fruit de burguespine froissez, qu'on met en un pot neufve bouillir avec un peu d'alun de roche pilé, ainsi se laisse reposer en lieu chaud par l'espace de six ou huit jours, puis se met en une vessie, de peur qu'il ne scorente ; on y adjouste si l'on veut, un peu de bleu d'espagne.

22. Le stil de grun se fait avec terre et le suc de certaines fleurs meslé dedans.

opposite the word "certaines," which shows that the stil de grain was sometimes made from the flowers of the *Genista Tinctoria*, Common Dyer's *Genista* or broom, Dyer's green, Le *Genêt des teinturiers*.

23. English red, otherwise called brown red,¹ red ochre, yellow ochre, umber, and yellow earth, are formed in the earth.

NAMES OF THE COLOURS.²

1. Snow-white, lime-white, milk-colour, black, vine-colour, silver-colour, lead-colour, water-colour, grey or mouse colour, livid-colour, straw-colour, flaxen-colour, gold-colour, Isabel-colour, violet-colour, saffron-colour, aurora-colour, flame-colour, scarlet red, rose-colour, green, colour of pastel ou verd naissant, citron-colour, flesh-colour, amaranth-colour, leek-colour, colour of verdigris, chesnut-colour, sad-colour, brunette.

2. There are 4 principal colours,—white, red, green, and black, or obscure.

3. Colours which have great brightness,—snow-white, silver-colour, pale gold, green, scarlet, water-colour, blue, and purple; all these colours are in the rainbow.

4. A purple colour is formed when an opaque whiteness is intermixed with the rays of the sun, as at daybreak.

CHAPTER VIII.

SEVERAL SECRETS IN PAINTING.

1. LIGHT colours should be intermixed with dark colours, as they give grace and adorn the picture; red ought to be intermixed with blue and green, white with grey and yellow; but

¹ Terra Rossa d'Inghilterra, the red Hæmatite.

23. Le rouge d'Angleterre autrement dit rouge brun, l'ocre rouge et jaune, terre d'ombre et terre jaune, se concreent en la terre.

NOMS DES COULEURS.

1. La couleur blanche comme neige, couleur blanche comme chaux, couleur de lait, couleur noir, couleur provine, couleur d'argent, couleur de plomb, couleur d'eau, couleur grise ou de souris, couleur livide, couleur paille, couleur blonde, couleur jaune comme l'or, couleur Isabel, couleur qui est entre violette, couleur de safran, couleur d'aurore, couleur de flame, escarlatte rouge, couleur vermeille comme le rose, couleur verte, couleur de pastel ou verd naissant, couleur citrine, couleur incarnadine, couleur amaranthe, couleur de poireau, couleur de verdegriis, couleur ternée dit de chastaigne, couleur de deuil, couleur brunette.

2. Elles sont quatre principales, la blanche, la rouge, la verte, et obscure.

3. Couleurs qui ont grand clarté, la blanche comme neige, couleur d'argent, d'or candide, verte, escarlatte, couleur d'eau, cendree, et de pourpre, lesquelles couleurs sont toutes en l'arc celeste.

4. La couleur de pourpre se fait quand une blancheur obscure est entremeslée aux rayons du soleil, comme en l'aube du jour.

CHAPITRE VIII.

PLUSIEURS SECRETS DE PEINTURE.

1. LES couleurs clairs doivent avoir lieu entre les obscures, elles donnent grace et ornement en la peinture ; la rouge couleur doit estre entremeslée entre la bleue et la verte, la

² It appears from a marginal note that the names of the colours are taken from Cardan, Lib. IV., de Subtilitate.

you must take care not to use too much white, for it is like poison, inasmuch as its splendour diminishes the grace and beauty of the painting; it also weakens other colours, and spoils their shadows.

2. Terre verte is used in the shades of flesh colour, but it must be employed sparingly, for, as the colours become old, they appear raw, and would thus produce a bad effect.

3. Some use red ochre in their flesh colours, and with this make a beautiful colouring.

4. To imitate a laughing face, the corners of the mouth must be turned up; if they are turned down, the figure will appear sorrowful and weeping.¹

5. The Italians use coal² black for painting external works, because it is a black which resists the injuries of time longer than any other colour.

6. The Italians burnish their mouldings, and then apply the gold with strong glue.

7. You must shade very much in sketching, as that will enable you to finish with greater facility.

8. Umber is of no use in the primings, for it absorbs the colours which are laid on it, and this produces a bad effect.³

9. To make very beautiful green for glazing, verdigris must be used with varnish which should be very brilliant and beautiful, and thus it will not fade soon.⁴

10. Fat oil is added to orpiment to make it dry, otherwise it would never dry; it is also added to indigo.

11. This orpiment is very beautiful in "dorage" and ornament.

¹ A marginal note ascribes this well-known fact to "M. Thierson, peintre."

² Common coal was also used by the Flemings in painting in oil. See the authorities cited by Mr. Eastlake, 'Materials, &c.,' p. 467.

blanche entre la grise et la jaune. Mais il faut prendre garde de auser trop de la blanche aux peintures, car elle est comme le venin et pour sa splendeur elle oste de la peinture la grace et la beauté, elle diminue les autres couleurs et corrompt l'ombre des autres choses.

2. On met de la terre verd aux ombrages de la carnation, mais il faut prendre garde d'en trop mettre, car les couleurs venant a vieillir, elles demeurent crues, et cela feroit un mauvais effet.

3. Aucuns usent d'ocre rouge dans les carnations, et avec icelluy font un très beau coloris.

4. Pour faire un visage riant, il faut que les extremités de la bouche montent en haut, si l'on les abaisse il sera triste et pleurant.

5. Les Italiens se servent de noir de charbon de terre pour travailler hors d'œuvres, comme estant un noir qui resiste plus longtemps à l'injure du temps que pas ung autre.

6. Les Italiens brunissent leurs moulures, puis appliquent l'or dessus avec de la colle forte.

7. Il faut fort ombrer en esbauchant, cela ayde a parachever avec plus grande facilité.

8. La terre d'ombre dans l'imprimure n'y vaut rien, car elle fait imbiber les autres couleurs qu'on mets dessus, et cela fait un mauvais effets.

9. Pour faire de très beau verd glassé, faut employer le ver-degris avec du verny ; cela sera fort beau et luisant, et si ne mouvera pas si tost.

10. L'on met dans l'orpin de l'huile grasse pour le faire seicher, car autrement il ne seicheroit jamais, pareillement dans l'inde.

11. Le dit orpin est très beau en cirage [dorage?] et ornement.

³ The reader will not fail to notice this condemnation of dark grounds.

⁴ Palomino and Lionardo da Vinci give similar instructions respecting the use of verdigris.

12. Verdigris also is very good if employed with fat oil.

13. Perspective and geometry are the foundations of painting, and serve to give proportions and measures to all things, and to give an appearance of reality.

14. Oil of chamomile is very good for painting,¹ and is as clear as rock water.

15. Enamel is cleaned with a ley made of ashes, and then washed with clean water. Soap is very efficient for cleaning brushes.

16. Vermilion is adulterated with lime; to detect this, it must be put on the blade of a knife [and heated]; if good, it will, when cold, be of the same colour as before, but if one side of the knife remain black, and then become brown and blackish, it will be evident that the vermilion has been adulterated.

17. Vermilion may be kept under cover for a long time, but when it is exposed to the air, the sun and moon spoil its beauty and diminish its brilliancy and vivacity.

18. Fat colours preserve their beauty longer than any others; hence it arises that gold lasts longer than any colour; on account of the "or de couleur," which is fat. To render the colours more durable, they must be used very thick, and must not be spared when they are used.²

19. The colour of the primed canvas is called "couleur mate," that is to say, "dead," on account of the fat oil; and gold is applied only on a "couleur mate," called "or couleur," which is made of divers colours, and is good for receiving the gold of gildings and cornices.³

¹ It is uncertain whether this word is written in the text "peindre" or "prendre." The former is most probable. I am not aware that oil of chamomile is used in painting; but from the manner in which it is mentioned in the text, I should think it possible that it may have been used to dilute the colours or varnish in the same way as distilled linseed oil, oil of

12. Le verdeggris est aussi fort beau employé avec huile grasse.

13. La perspective et la géométrie sont les fondemens de la peinture, et servent à donner les proportions et mesures à toutes choses, et faire les reconnoissances.

14. L'huile de camamine est très bonne pour prendre [peindre ?] et est claire comme eau de roche.

15. On degresse lesmaile avec laissive que l'on fait avec cendre, puis on la lave avec caue nette. Le savon est très bon pour degrosser et nettoier les brosses.

16. On sophistique le vermillon avec de la chaux, pour l'essprouver il le faut mettre sur une lame, si il est loyal et marchant, estant refroidy, il aura sa mesme couleur, mais s'il garde une costé noire, et devient brun et noirastre, c'est signe qu'il a de la mechanceté.

17. Le vermillon se conserve longtemps s'il est à couvert, mais à l'air le soleil et la lune massacent sa beauté, et meurtrissent l'esclat de sa vivacité.

18. Les couleurs grasses demeurent plus longtemps belles, d'ou vient que l'or dure plus qu'aucunes couleurs, cela provient de l'or de couleur qui est gras, aussi pour faire demeurer ses couleurs plus longtemps belles, il les faut employer grasse, et ne point espargner les couleurs en travaillant.

19. La couleur de la thuille imprimée se dit couleur mate, c'est-à-dire, qui est comme mort, à cause de l'huile grasse, et l'or ne se met sinon sur une couleur mate, ce qu'on dit or couleur qui se fait de diverses couleurs, et est bonne pour recevoir l'or des dorures des corniches.

spike, naphtha, &c. Oil of chamomile is mentioned in the Bolognese MS., p. 518.

² Lebrun quotes the authority of M. Thiesson for these observations.

³ Couleur mate. See this subject, *supra*.

From this, as well as No. 7, Cap. I., it appears that yellow grounds were used at this period.

20. In pictures exposed to the air, artificial colours should not be employed, but mineral colours and earths only, such as red and yellow ochre, yellow earth, umber, green earth, English red, "cendrées," smalt, and similar pigments. Smalt becomes more beautiful by being exposed to the sun than by being left in a close situation; also paintings are much better when exposed to the air than when kept in a moist and dark place.

20 a. The design must be bold, that is to say, the attitude of the person represented, making him look over the shoulder, for that gives grace and elegance to a picture.

21. Indigo entirely fades if exposed to the sun, and so does minium; indigo also fades if exposed to water.

22. To preserve pictures from dust and fly-marks you must take some white of egg and beat it until it becomes like rock-water, and varnish the pictures with this: when necessary, the white of egg may be cleaned by passing a wet cloth over the picture, which easily removes the white of egg, together with the dust attached to it. This cannot be done with varnish.

22 a. One of the principal points in painting is to balance the figures well in the picture, so that the head should not be beyond the foot on which the figure is placed, for this would give rise to great faults.

23. Drying-oil is made by putting some nut-oil into a pipkin, into which is put a rag containing umber and minium, which is suspended to the handle of the pipkin, and then boiled.

24. Fat oil is made by putting a bag of litharge into a pipkin with oil, and boiling it.

25. Or the litharge may be ground on the porphyry with oil made into a little ball and dried. When it is wanted for use it is boiled until the litharge is dissolved, and when cold the oil becomes as clear as rock-water.

20. Un tableau pour mettre à l'air, on n'y doit point employer couleurs qui sont composées, mais seulement les minerales et qui proviennent de terre comme ocre rouge et jaune, terre jaune, terre d'ombre, terre verd, rouge d'Angleterre, cendrées, esmailles et autres semblables. L'esmail devient plus belle au soleil qu'en lieu fermé, aussi un tableau se porte toujours mieux à l'air que en un lieu humide et obscure.

20 a. Il faut que le crayon soit hardi, c'est-à-dire, le posture du personnage qu'on represente, en la faisant regarder par dessus l'espaule, et cela donne de la grace et orne mieu un tableau.

21. L'inde devient toute blafarde si elle est mise au soleil, la mine toute de mesme si elle est à l'eau ; de mesme pour l'inde.

22. Pour conserver les tableaux de poussière et chiure de mouches, il faut prendre de la glaire d'œuf et la battre tant qu'elle soit devenue comme eaue de roche, puis les vernir avec, lesquels on nettoie quant on veut, car prenant un linge mouillé et en passant par dessus, on emportera facilement ladite glaire avec la poussière attachée dessus, ce qui ne se peut faire avec verny.

22 a. C'est un des principaux points de peinture que de bien planter les figures dans le tableau, en sorte que la teste n'excede la pied sur lequel la figure se pose ; car autrement il y auroit de lourdes fautes.

23. L'huile siccative se fait mettant en une chopine de l'huile de noix dans laquelle on y met un linge plain de terre d'ombre et mine, que l'on pend à lance du pot, puis la fait on bouillir.

24. Huille grasse se fait avec de la litarge que l'on met dans un sachet en une chopine avec de l'huile, puis on la fait bouillir.

25. Autrement on broie la litarge avec huile sur le porphyre, et en fait on petite balle que l'on fait seicher, puis quand on s'en veult servir, on les fait bouillir jusques a ce que la litarge soit fondue ; puis estant froide, elle devient clair comme eaue de roche.

26. This oil is very good for drying the colours which do not dry, such as common lake, fine lake, white lead, black, ochre, [?] and other similar colours, which dry slowly.

27. To counterfeit ebony, take lamp-black, with which ink and a little glue are mixed ; some persons add vinegar instead of the glue ; the mouldings are then passed over 3 or 4 times with this composition, and afterwards rubbed with a piece of rag or a reed to polish them. After this they are rubbed with a waxed cloth or with a piece of wax, to make them shine like ebony. If there are any spots, they are to be removed by rubbing with reeds.

28. To make all kinds of polished woods take the colour of ebony, so as to deceive by them.

The wood which is to be made the colour of ebony must be rubbed with a coat of "eau forte d'esteinte," (?) and when dry, 3 or 4 coats of good ink which does not contain any gum, must be applied. The wood must then be rubbed with a rag or cloth, or a brush made with Spanish reeds, and afterwards for a long time with wax ; and lastly, wiped with a clean cloth, when it will be like ebony.

Note that the wood of the pear tree is more proper than any other wood.

29. Ground glass mixed with the colours is good to make them dry.

30. To make wood of the colour of Brazil wood, rub it with distempered quicklime. The lime penetrates and thus makes it of a red colour. If the wood be afterwards rubbed with oil it will be more beautiful. Remember that pear-tree wood is more proper for this than any other wood, because it is naturally much inclined to redden.

31. To fix the tin on coats of arms, take some parchment glue with a little honey, and boil them together. Some per-

26. La dite huile est très bonne pour faire seicher les couleurs qui ne seichent point, comme lacque fine et commune, blanc de plomb, noir, ocree, [?] et autres semblables couleurs qui sont long temps à seicher.

27. Pour contrefaire le bois d'ebene, on prend de noir de fumée avec de l'ancre, et un peu de colle meslée dedans, aucuns y mettent du vinaigre au lieu de la dite colle, puis on passe par dessus les moulures trois ou 4 fois avec la dite composition ; après on les frottes avec un chiffre ou jonq pour les polir, cela estant fait on les frottes avec un linge ciré ou avec un morceau de cire, pour les rendre luisantes comme ebene, s'il y a quelques taches, on les fait en aller avec des joncs à force de frotter.

28. Faire prendre couleur d'ebene a toute sorte de bois, pourveu qu'il soit polli, en sorte qu'on si pourra tromper.

It faut frotter le bois qu'on desire teindre en couleur d'ebene, d'une couche d'eau forte d'esteinte, puis estant seiche, faire trois ou quatre couches de bonne ancre qui ne soit point gommée, faut frotter le dit bois avec un chiffre, ou linge, ou brosse faite avec joncs d'Espagne, puis le refrotter longuement de cire, après l'essuier d'un morceau de drap net, et sera, comme ebene.

Notté, que le poirier y est plus propre qu'autre bois.

29. Le cristal broyé mis dans les couleurs est très bon pour les faire seicher.

30. Pour faire bois de couleur de bresil, il faut prendre de la chaux vive destrempée, et en frotter très-bien le bois qu'on desir avoir de couleur de bresil. La chaux pénétrant au dedans le fait devenir ainsi rouge, si on le frotte puis après avec de l'huile il en sera plus luisant.; notté que le poirier y est plus propre qu'autre bois, à cause que de soy il ne demande qu'à rougir.

31. Pour asseoir l'estain sur des armoiries, on prend de la colle de parchemin avec un peu de miel que l'on fait bouillir

sons use flour-paste. If the tin is to be fixed with oil, "or de couleur"¹ is to be used.

32. To prime a canvas quickly, so that a person may paint on it the same day that it has been primed, you must grind together some parchment glue and oil priming,² and immediately prime the canvas with this ; it will harden directly, but this priming is very apt to scale off when the canvas is rolled up.³

33. Minium in the flesh colour makes a beautiful colouring without ochre, because it naturally contains ochre, provided that it is not exposed to the air ; for the sun causes it to fade and lose its beauty.

34. The longer the canvas has been primed the more valuable is it, for the colours which are afterwards laid on it become brighter.⁴

35. If one desire to paint in oil on wax, the wax must first receive a coat of well-beaten white of egg to cause the colours to adhere, and also to enable one to paint on it more easily ; the white of egg must also be applied on glass and lead.

36. A similar coat of white of egg is also applied on marble and alabaster before laying on the colours, whether they are used with gum or with oil.

37. Ivory must be washed with the water which is found under horse-dung, for the colours cannot be applied without this secret and invention.

38. The stones of peaches and plums burnt and extinguished in vinegar make a most excellent black.

39. To make blue draperies which are very beautiful, and which are made with azure in powder, first paint them with black and white, the lights being very strong (i. e. very white)

¹ Or de couleur. See p. 836.

² Oil priming. See ante, p. 772.

ensemble, aucuns se servent de colle de farine. Sy l'on le veult asseoir en huile, on prend or de couleur.

32. Pour imprimer une thaille promptement en sorte qu'on y puis peindre le meme jour qu'elle aura esté imprimée, il faut prendre colle de parchemin et imprimure en huile, puis broyer le tout ensemble et aussitôt en imprimer sa toille, et durcit incontinent, mais le dit imprimure est sujet a s'escailler sitôt que l'on enrolle la toille.

33. La mine dans la carnation fait un beau coloris sans ocre, à cause que de soy elle porte son ocre, pourveu qu'elle ne soit point mise à l'air, car le soleil la fait devenir toute blaffarde et massacre sa beauté.

34. Plus les thailles sont vieilles imprimées tant mieux vallent, les couleurs qu'on met pas après dessus en deviennent plus belles.

35. Sy l'on desire peindre sur la cire avec des couleurs en huyle, il faut luy donner auparavant que d'y appliquer les couleurs, une couche de blanc d'œuf battu pour les faire tenir, et afin aussi d'y peindre plus facilement, il faut faire le semblable sur le verre et sur le plomb.

36. On donne à l'albastre et au marbre semblable couche de glaire d'œuf auparavant que d'y mestre les couleurs, soit en gomme ou en huile.

37. Sur l'yvoire il faut que se soit avec l'eau qui se trouve sous le fumier de cheval, car on n'y peut peindre autrement ; les couleurs n'y pouvant estre appliquées que par ce secret et invention.

38. Les noieaux des pesches et des prunes bruslées, et d'estains en vinaigre font un noir très excellent.

39. On fait des habits bleu qui sont fort beau et se font avec azur à poudrer, il les faut faire de blanc et noir, lesquelz il faut que le rehaut soit fort clair (c'est à dire fort blanc), et les

³ It must be previously glued with flour paste.—*Note by Author.*

⁴ Because the surface is quite hard, and the colours do not sink into it.

and the shades very dark, so as to appear very beautiful ; they must then be powdered with “ azur.”¹

40. To illuminate figures or medals, either of plaster, alabaster, wood, earth, or similar things. First apply a coat of clear fish-glué, and then the colours may be laid on with gum. Nothing is so beautiful and brilliant as these figures. This secret is considered rare, and is of the first importance to the illuminator. The glue does not in any manner fill up the folds and hollows of the figures as other glues do ; for even when painted one may perceive their finest lines and most delicate hairs.²

40 a. Lamp-black is poison among the other colours, as well as verdigris. This black lasts a long time, and is very easy to use.

41. If some minium be mixed with white lead and a little fine lake a most beautiful carnation will be formed, as I know from experience.

42. If a little umber be mixed with bone-black and common lake, or if “ stil de grain ” be mixed with common lake and a little minium, a most beautiful colour for shadows will be produced.

43. The purple colour made with fine lake and white lead harmonizes very well with green, white, and yellow draperies.

44. Verdigris is added to charcoal black, or lamp black, to make these colours dry, but it is used only with the shadows, for it is a poison in painting, and kills all the colours with which it is mixed.

¹ Azure in powder. This appears to be a good method of painting blue draperies, because no oil is necessary but that which cements the black and white. This method of employing azure in powder was common in France, as appears from a passage in the *Traité de Mignature de Cristophe Ballard* (Lyon, 1693—the first Edition was published in 1682), p. 217. In the

ombrages fort noirs pour paroistre fort beaux, puis les poudrer avec azur.

40. Si l'on veult enluminer quelques images ou medale soit de plastre, albastre, bois, terre, et autres choses semblables, il faut passer par dessus une couche de colle de poisson fort claire, puis appliquer dessus ses couleurs avec de la gomme ; on ne voit rien de si beau et luisant comme sont les images (ce secret est tenu rare et est des premier pour l'enlumineur) la dite colle ne remplit aucunement les plis et creux des images comme font les autres, car encore bien qu'elle soient peintes, on y peut remarquer jusques au moindres traictz et cheveux les plus délicats qui se voient.

40 a. Le noir de fumée est venin parmy les autres couleurs, ainsi que le verdegri. Ce noir dur fort long temps, et s'y est fort facile à employer.

41. Si l'on mesle parmy le blanc de plomb de la mine avec un peu de fine lacque, cela fera une très belle carnation, ainsy que je l'ay espruvé.

42. Si l'on y mesle un peu de terre d'ombre avec noir d'os et grosse lacque, il fera un fort belle ombrage, ou bien stil de grun et grosse lacque avec un peu de mine.

43. La couleur de pourpre faite avec fine lacque et blanc de plomb revient fort bien avec les habitz verds, et les blancs, ensemble avec les jaulnes.

44. On met dans le noir, soit de charbon, ou fumée, du ver de gris pour le faire seicher, il ne s'en faut servir que dans les ombrages, car il est venin dans la peinture, et fait mourir tous les couleurs parmy lesquelz il est meslez.

latter work the azure is called "email," and was probably smalt or the Italian Smaltino, which all persons agree was extremely difficult to use on account of its gritty texture. And see Mr. Eastlake's 'Materials, &c.,' p. 455.

² P. Anselme.—*Marginal note by Author.*

CHAPTER IX.

HOW TO SPEAK OF BEAUTIFUL PAINTINGS.

1. **THAT** is not painting, it is nature; and those figures look at the spectators, but with so natural a look that you would swear they are alive.

2. Do you see those fish? Why they would swim if you were to pour water on them! Then look at those birds, which would fly away and pierce the sky unless they were secured, they are so well done.

3. Is it possible that the pencil can have given such softness by such rough touches, and that such apparent carelessness should be so attractive?

4. When painting was in its infancy, and a suckling, painters handled the pencil so clumsily, and their works were so badly executed, that they were obliged to write under an object "this is an ox," otherwise you might have taken it for a quarter of veal, but at the present time painters are obliged to write under the figures "these are painted," lest the spectator should fancy that they are dead figures glued to the canvas, and they appear like living beings without motion, from being so well executed.

5. Rich pictures must be spoken of as if they were real objects, not imitation. See how those dolphins play in the water which they have so agitated, and look at the birds, some of them warbling on the branches, others flying away and disappearing in the clouds!

6. Apelles painted what could not be painted: one might hear the roar of the thunder, and the crackling of the clouds, flashing with lightning.

7. See how well the folds of that drapery are arranged! Look at those snow white hands, where the veins seem to swell at each beat of the pulse! See how those muscles grow and swell! One may count the ribs, and the body is as well done as if Nature herself had formed it! Is it natural and real, or is it produced by art?

8. Why did you give this horse a bridle, this horse which is

CHAPITRE IX.

LA FAÇON DE PARLER DES BEAUX TABLEAUX.

1. CELA n'est pas peinture, mais nature et ces personnages là regardent tous ceux qui les regardent, mais d'une œillade si naïve que vous jureriez qu'ils sont en vie.

2. Voyez-vous ces poissons là, si vous versez dessus de l'eau ils nageront, car rien ne leur manque et les oyseaux s'ils n'estoient attachez ils prendroient l'air, et fendroient le ciel, tant sont ils bien faitz.

3. Comme est il possible que le pinceau ait couché tant de douceurs sous ces traitz si rudes, sous des couleurs si rudes, et que parmy tant de nonchalance, on ait couché tant d'attraits.

4. Quand la peinture estoit encore au berceau et à son premier lait, le pinceau estoit si niais, les ouvrages si lourds, qu'il falloit escrire dessus : c'est un bœuf, autrement vous eussiez pris cela pour un quartier de veau, maintenant il faut mettre dessous, qu'un tel peignoit de peur qu'on ne crut que ce sont des morts qu'on a collé sur la toile, et des personnages vivants sans vie tant le tout est bien fait.

5. Pour parler des riches peintures, il en faut parler comme si les choses estoient vrayes, non pas peintes. Voyez, je vous prie, comme ces dauphins follastrent dans ces bouillons d'eau qu'ils soulevent. Comme ces oyseaux, perchez sur ces ramées gazouilles, voi les qu'ils s'envolent et se cachent dans les nuées.

6. Apelles peignoit ce qui ne se pouvoit peindre : on oyoit craquer les tonnerres et les tintamares des nuées esclattantes et toutes trenchées d'esclaires.

7. Voyez comme ce drap est bien plissé, voyez ces mains de neige ou les veines s'enflent et semblent battre à la cadance du poux ; voyez ces muscles comme ils se poussent et s'enflent ; on peut conter les costes de ce corps, tout le corps est aussi bien fait que si la nature l'avoit faconné de ses mains, mais encore est ce peinture ou nature, verité ou artifice ?

8. Mon amy, pourquoy avez vous donné une bride à ce che-

running at full gallop, foaming at the mouth, and looking as if it were out of breath? I did it on purpose, for with two more bounds he would have been out of the road and out of the canvas, so you see I was obliged to hold him back by a bit; see how it makes him rear and caper!

9. How finely and gracefully this ground is broken and trel-lised!—you would swear that it was hollow and very deep.

10. See how these springs rise on the tops of the mountains, and how the pencil of the painter makes these brooks to flow as well as Nature could do! They pursue their course full of small ripples, so agreeable to those lively little fish that swim between the waves. Look at the ducks gliding among the herbs, and see how they dive, raising heaps of little threads or hair-like lines of water! but you had better move back a little, lest they should sprinkle or splash you by shaking and beating the water with their feet.

11. The pictures of Philostratus are excellent in this respect, and will make you very rich in these matters.

CHAPTER X.

A TREATISE CONCERNING THE GREATEST PAINTERS OF THE WORLD.

THE first painters of reputation whose works are seen with admiration, and that not only on account of their antiquity, are Polygnotus and Ataglarphon,¹ whose simple method of using one colour only is even now practised by some, and is so esteemed, that these first elements of the new-born art are preferred to the works of the great masters who followed them, from a certain ambition, as I presume, of attributing to themselves a more particular knowledge of things out of the common way. After-

¹ Probably Aglaopho.

val qui court de tout sa puissance et jette son escume à gros bouillons et est hors d'haleine? Je l'ay fait a dessein, car en deux bonds il se fut jetté hors de la carrière et hors la thoile; il la fallu retenir par forche, voyez comme par despit il s'en cabre.

9. Mon Dieu, que ce fonds est haché bien menu et trellissée de bonne grace, vous jureriez que c'est une chose creuse et bien profonde.

10. Voyez comme ces fontaines sordent des croupes de ces montagnes, comme la main du peintre meine les ruisseaux aussi bien que scauroit faire la nature, ils poussent hors par endroits tout plein de petits surjons bouillonnans commode à ces petits follastres de poissons qui nagent entre flot et flot. Voyez comme ces canards se coulent parmy ces herbes et couvillent. Voyez la comme ils se plongent boursoufflant contre mont de petits brins et filet d'eau, retirez vous un peu à l'escart, de peur qu'il ne vous aspergent et mouillent en fretillant ainsi des pattes et battant l'eau.

11. Philostrate en ses tableaux est excellent en cecy, et vous fera riche en ceste matière.

CHAPITRE X.

TRAICTÉ TOUCHANT LES PLUS EXCELLENS PEINTRES DE L'UNIVERS.

LES premiers peintres de réputation dont les ouvrages se voient avec admiration, et non seulement en recommandation et faveur de leur antiquité, furent Polygnotus et Ataglarphon,¹ desquels le traict tout simple et d'une seule couleur, se fait encore aujourd'huy par aucuns tellement estimer, qu'ils préférèrent ces premiers elementz de l'art qui ne faisoit encore que de naistre, aux ouvrages de ces grands maistres qui ont esté depuis, par certaine ambition, comme je présume, de s'attribuer

¹ Quintilian, ch. xvi., liv. 12.—*Marginal note by Author.*

wards Zeuxis and Parrhasius, almost contemporaries, contributed greatly to the advancement of this art. Zeuxis is said to have discovered the art of painting in relief by means of light and shade, while Parrhasius proceeded to study delicacy and neatness of touch, for Zeuxis was the first who gave substance and living flesh to the limbs of his figures, as he found this manner more magnificent and august. In this he is said to have imitated Homer, who represents the most robust figures as the most beautiful, even when speaking of women. Parrhasius limited and determined all that concerns painting, so that he has acquired the name of the Legislator, inasmuch as all succeeding painters, as if compelled by necessity, have followed him in his manner of representing the gods and heroes. The art of painting flourished principally in the time of Philip and Alexander, but in different degrees of perfection. Protogenes was studiously elaborate; Pamphilus and Melanthius possessed a fine style; Antiphilus worked with great facility; Theo of Samos was wonderfully inventive and full of great imagination in design; Apelles excelled in the beautiful and ingenious disposition of his subjects, and in his unequalled grace in painting amorous subjects, of which he made his boast; and Euphranor was admired because, being among those most skilled in literature, he occasionally proved himself an excellent painter and sculptor. Among the modern painters we may mention Michael Angelo, Raffaello d'Urbino, Chivoly (Cigoli?) Buonarroti [!] Parmigiano, Salviati, Polidor of Parma, and Titian. But Michael Angelo was greater in sculpture than in painting. Bassano was one of the most esteemed of his time, although there was a certain roughness in his style.¹ Antonio Tempesta, an Italian, designed very cleverly, and for hunting scenes is unequalled. The Carracci are three Italian brothers,² who are unequalled by any of their contemporaries, and paint with such grace that they are

¹ Leonardo da Vinci, one of the most remarkable of painters, was never satisfied with his works, few of which he completed, because, it is said, that he could never realise with his hand the conceptions of his mind.

² This is a mistake. Annibale and Agostino Carracci were brothers; Ludovico was their elder cousin.

une propre et plus particulière intelligence de telles choses au dela du commun. En suite Zeuxis et Parrhasius, presque contemporains, adjoustèrent grandement à cest art de peinture. On tient que Zeuxis trouva la manière de peindre de relief par le moien des jours et des ombres, et que Parrhasius s'étudia d'avantage à la délicatesse et netteté du traict, car Zeuxis fut le premier qui donna du corps et de la chair vive aux membres de ses figures, trouvant ceste manière plus magnifique et plus auguste ; et comme ils tiennent imitant en cela le poëte Homere, qui nous represente les figures les plus robustes pour les plus belles, mesmes en femmes ; quant à Parrhasius, il a tellement compris et déterminé tout ce qui concerne la peinture, qu'il en a remporté le nom de legislateur, d'autant que tous les auteurs comme par nécessité forcée, le suyvent en sa manière de représenter les dieux et les héros. Or la peinture fleurit principalement environ le temps de Philippe, et jusques aux successeurs d'Alexandre, mais en diverses parties de perfection, a part Protopogenes estoit grandement studieux de bien élaborer ses ouvrages, Pamplius et Melanthius tenoient une belle manière, Antiphilius travailloit avec grande facilité, Theon de Samos estoit merueilleusement inventif et plain d'imaginations pour le dessein, Apelles excelloit en belle et ingenieuse disposition et grace noppareille de peindre amoureusement dont luy-mesme se vantait, Euphranor se fait admirer en se questant des mieux pourveu de bonnes lettres, il estoit quant et quant un merueilleux ouvrier de peinture et sculpture, ensuit de ceux cy sont ensuivi plusieurs excellents maistres comme Michel-Ange, Raphael, Urbain, Chivoly, Bonnarot, Parmesan, Salviat, Polidore de Parme et du Titian, mais Michel-Ange estoit tenu pour plus grand ouvrier en fait de sculpture que de platte peinture. Basan estoit des mieux estimé de son temps, touteffois avoit une manière rude en ses ouvrages. Anthonio Tempeste Italien

¹ Leonard de Vinci, peintre singulier entre les autres, ne se contentoit jamais d'ouvrage qu'il peut faire, et n'en menoit que peu au point jusqu'à totale perfection, et disoit que cestoit a cause que sa main ne pouvoit atteindre à la conception de son entendement.— *Note by Author.*

admired by every one. Peter Paul Rubens is a very clever man and a Fleming; it was he who worked at the Luxembourg. Laurence Dubry,¹ a Fleming, is considered one of the best landscape painters. M. Bunel² is the best painter in France; he worked at the Tuileries and in the galleries of the Louvre; his two best paintings are an Assumption and a "Pentecost;" one is at the "Feuillans" and the other at the Augustines at Paris; they are his latest works, and were executed a short time before he died. Freminet,³ who left the unfinished paintings at Fontainebleau, has been highly esteemed. Vouet⁴ is considered one of the best of the present day. Vaulezar is reputed to be very clever in painting and perspective. Lallemand⁵ also is highly esteemed. M. Thiesson is also a very clever man.

CHAPTER XI.

OF "ESTOFFERIE,"⁶ OR HOW TO GILD.

PAINTERS use three kinds; viz. ground gold, *aurum contusum*, which serves for illuminating images, or writing with the pencil; burnished gold, *aurum politum*; this word "bruni" has two meanings; sometimes it means to shade and make brown, sometimes to polish and lighten; and "or mat," *aurum impolitum*. "Mat" comes from the Greek *ματαιος*, stultus, de-

¹ Perhaps one of those painters brought from the Netherlands by Ambrose du Bois and Jean de Hoÿ, and who assisted in painting in the Luxembourg. (Felibien, Vol. II. p. 114.)

² Jacob Bunel, painter to the King of France. He was born at Blois in 1558. His father, François Bunel, was also a painter. Jacob painted with Breuÿl in the small gallery of the Louvre. Felibien, &c. Vol. I. p. 712.

³ Martin Freminet, a native of Paris. He succeeded Du Breuÿl in the works of the Louvre and Fontainebleau, and was chosen painter in ordinary to the King. He was in great favour with Henry IV. and Louis XIII.,

très habil homme pour le dessein, mais pour des chasses il est sans pareille. Les Caraches sont trois frères italiens des meilleurs qui soit pour les present, et peignent de si belle grace qu'il se font admirer de tout le monde. Pierre Paul Rubens tres habil homme flaman de nation, c'est celuy qui a travaillé a Luxembourg. Laurens Dubry flaman est tenu des meilleurs pour le paysage. Monsieur Bunel estoit le meilleur peintre de la France, il a travaillé aux Thuilleries et aux galleries du Louvre, les deux meilleurs pièces qu'il ait jamais fait sont une assomption et une pentecost ; l'une est aux feuillan et l'autre aux Augustins à Paris ; ce sont les deux dernières pieces qu'il fist quelque peu de temps auparavant que de mourir. Freminet a esté aussi grandement estimé, c'est celuy qui a laissé les peintures de fontaine blau imparfaite. Vouet est estimé des meilleurs d'aujourd'huy. Vaulezar est estimé très habile homme pour la peinture mesme pour la perspective. Lallemand est aussi fort estimé. Monsieur Thiesson est aussi très habil homme.

CHAPITRE XI.

DE L'ESTOFFERIE, OU MANIERE DE DORER.

Les peintres se servent de trois sortes, d'or moulu, *aurum contusum* qui est propre pour enluminer les images ou escrire avec le pinceau ; d'or bruni, *aurum politum*, ce mot brunir a deux significations, quelquefois il signifie rendre brun et obscure et quelquefois pollir et esclaircir ; et d'or mat, *aurum impolitum*, mat vient du grecq mataios, stultus, demens, inneptus ; et en

but did not live long to enjoy his honours, dying in 1619, before he had completed the chapel at Fontainebleau. See Felibien, p. 114.

⁴ Vouet, Simon, born at Paris in 1582, died 1641. Félibien says that France is indebted to him for having revived the good manner of painting, and for having educated a number of pupils, many of whom afterwards rose to eminence.

⁵ Lallemand, Georges, a native of Nancy. He executed a number of designs for tapestry, and many pictures in churches.

⁶ Estofferie—the Estofado of the Spanish. See Pacheco, p. 352.

mens, ineptus ; and in Italian *mat* signifies *silly*, so that “or mat” is *silly gold*, without brilliancy and splendour. *Matois*, i. e. a do-nothing, a fool, and a good-for-nothing fellow ; it is generally taken for a sharp and cunning man, *per antiphrasim quasi minime stultus*. It would also seem that this word, check-mate, and give check, and “mate,” are derived from this root, meaning to stun a person, and exhaust all his resources ; the Italians are great chess-players, the expression check-mate being derived from them.

It may also be said that this word *mat* or *mate* is derived from the game of chess, so common among the Indians and Persians, for both nations call this by the same name. They call this game *Scha*, i. e. king ; and *Schatrah*, i. e. the game of king ; as also *schamate*, which means “the king is dead,” just as we say check-mate ; so that “or mat” is a dead or dull gold, as opposed to a lively and brilliant gold. These words are taken from the author of the ‘States and Empires,’ in the abridgment of his history of the kings of Persia, article ‘Nexere anauxion, 31 Roy.’ “Mat” signifies also a moist or flat colour.

*First, ground Gold.*¹—To grind fine gold, so that one may paint or write with it with the pencil, you must take gold leaf with 4 drops of honey, mix the whole together, and put it in a small glass vessel ; when wanted for use, it must be distempred with gum-water.

Another mode of grinding Gold.—A proper quantity of beaten gold or silver is to be spread inside a smooth glass cup, and moistened with clear water. The leaves are then rubbed with the finger, wetting them occasionally, and not spreading them too much while rubbing ; this process is continued until all the leaves of gold are well ground, continually adding water. When they are properly ground, the cup

¹ Ground gold. *Note by Author*, “Le Sieur Alexis.” It is a transla-

langue italique, *mat*, signifie sot, de façon que or *mat* est un or qui est sot et sans éclat et splendeur. *Matois*, id est homme vain qui ne fait rien qui vaille un plaisant et vaurain [vaurien]. On le prend ordinairement pour un homme fin et rusé *per antiphrasim quasi minime stultus*, il semble aussi que ce mot des eschets *mat*, comme donner eschets, et *mat* vient delà, voulant dire rendre une personne toute estourdie et au bout de son roulait; les Italiens sont fort grands joueurs d'eschets, leur ayant donné ce mot de *mat*.

On peut aussi dire que ce mot de *mat* ou *mate* est dérivé du jeu des Eschets fort familier aux peuples Indiens et Persans qui tous deux usent en icelluy de mesme noms, car ils appellent ce jeu *scha*, c'est à dire roy et *schatrah* jeu de roy, comme aussi *schamate* qui signifie le roy est mort, c'est ce que nous disons eschets et *mat*; de sorte que or *mat* c'est un or mort ou morne qui n'est point vif ny esclattant; ces mots icy sont tirés de l'auteur des Estats et Empires en l'abregé de l'histoire des roys de Perse, article de Nexere anauxion 31 roy.

Mat, signifie aussi une couleur moite et grasse.

Premier, Or moulu.—Pour broyer l'or fin duquel on puis peindre ou escrire avec le pinceau. Il faut prendre feuilles d'or battu et quatre gouttes de miel, meslez le toute ensemble et les mettres en un cornet de verre, et quand on s'en veult servir, il le faut detremper avec de l'eau de gomme.

Autre manière de broyer l'Or.—On prend autant d'or et d'argent battu que l'on veult et les estend on en une tasse de verre bien unie mouillée d'eau clair, puis les broyer avec le doigt en les mouillant aucune fois, mais il ne les faut pas trop estendre en les broyant et ainsi continuer jusque a ce que toutes les feuilles d'or soient bien moulues en y adjoustant tousjours de l'eau et quand ils semblent assez broyée il faut

tion of a recipe in the first part of the Screti of D. Alessio Piemontese, Lib. V.

must be filled with fresh water and stirred well. The gold is then left for $\frac{1}{2}$ an hour to settle, after which the water is poured off, and the gold remains at the bottom of the cup. This is dried, and when used is distempered with gum-water. This is the best way of grinding gold.

Burnished Gold.—To make the ground for burnished gold, you must take Armenian bole of the size of a nut, according to the quantity which is to be made; bloodstone, of the size of a bean; roche alum, of the size of a pea; and a little vermilion, to colour the mordant, with a burnt crust of bread to make it dry; the whole ground on the porphyry with a little water and glue.

Another mode:—Take Armenian bole of the size of a bean, a little more or less according to the quantity which is to be made; half as much of bloodstone, with a clove of garlic, and a little tallow, the whole ground up together with soap-suds and a little glue.

Another way:—You must take gypsum of the size of a nut, Armenian bole of the size of a bean, the same quantity of hepatic aloes, and one-third as much of sugar candy; powder each ingredient separately, then, putting them all together, you must finally add a little “civette” or a little honey.

Another way:—Take equal quantities of fine gypsum, hepatic aloes, and Armenian bole, distempered with some white of egg which has been strained through a linen cloth. If this composition is too stiff, it is to be distempered with fresh water.

Another way:—Lay on the gold with well-gummed water alone; and this method is very good for gilding parchment or skin. You may also use fresh white of egg or fig juice alone in the same manner.

emplir la tasse d'eau fraîche, et l'esmouvoir très bien ; cela fait il les faut laisser reposer une demye heure, puis on coule l'eau hors, l'or demeurant au fond de la tasse qu'on laisse seicher, et l'or que l'on s'en veut aider et servir, on le destrempe avec de l'eau gommée, cecy est la plus belle manière qui soit pour faire l'or moulu.

Or bruni.—Pour faire l'assiette à dorer d'or bruny, il faut prendre bol armenique environ la grosseur d'une noix selon la quantité que l'on en veut faire, la grosseur d'une febvre de sanguine, allun de roche la grosseur d'un poix, et un peu de vermillon pour donner couleur à la dite assiette, avec une crouste de pain bruslée qui sert pour faire seicher, le tout broyez avec un peu d'eau et colle sur le porphyre.

Autrement :—On prend la grosseur d'une febvre de bol armenie peu plus peu moins, selon la quantité que l'on desire en faire, et la moitié d'autant de sanguine, avec l'œil d'un ail, et un peu de suif de chandelle, le tout broyé avec de l'eau savonnée en y ajoutant un peu de colle.

Autrement :—Il faut prendre gipsum de la grosseur d'une noix, bol armenique la grosseur d'une febvre, aloë épatique la grosseur d'une febvre, et un tiers de sucre candy ; étampé chacun à part soy et mettant l'un sur l'autre on y applique à la fin un peu de civette ou de miel.

Autrement :—On prend gipsum fin, aloë épatique, bole armenique, autant de l'un que de l'autre, destrempé avec de la glair d'œuf frais, laquelle on aura coulé par un linge ; et si la dite assiette est trop forte, on la destrempe avec de l'eau fraîche.

Autrement :—On prend de l'eau bien gommée, et avec icelle seule on met l'or ; et est (la dite assiette) bonne sur parchemin ou sur peaux. Le mesme peut on faire avec de la glaïre d'œuf fraiz, et aussi avec laict de figue seulle.

Remember, that, previous to laying on the gold, the subject to be gilded must have seven coats of Spanish white distempered with tolerably strong parchment glue,¹ which must be smoothed with a linen cloth dipped in clear water, and then rasped or polished to make it smoother. When this is done, two coats of the above-mentioned mordant are laid on it, and when these are dry, it is cleaned with a piece of frieze. When the gold is to be applied, the preparation is moistened with a pencil dipped in clear water, and the gold laid on. It is then allowed to dry, after which it is polished with the tooth of a dog or wolf, and a beautiful burnished gold is the result.

If there are any defects in the gold after it is polished, a piece of gold is to be laid on the defective part, and attached with the breath, and then polished.

To gild on copper with burnished gold, the copper must first be polished and made red hot, in order to apply the gold with the agate burnisher, and it must then be heated again. Two or three coats must be laid on in this manner, after each of which coats it must be replaced over a slow charcoal fire, in order to polish it. When gold is applied on paper, the front tooth of an ox may be used.

“*Or mat,*” to make “*or de couleur.*”—You must take all the dirty colours, and put them to boil on a chafing dish in an earthen vessel, with fat oil out of the pinceliere.² After this has been thus boiled, it is passed through a loose cloth and again boiled; and if the said “*or de couleur*” is not sufficiently yellow, you must add some yellow ochre, a little coarse masticot and minium, which must be well ground; and this will make it dry well.

Another mode. Take Armenian bole, ground up with lin-

¹ *Note by Author.* “Before boiling the glue, it must be purified by washing it with ashes and hot water, until it is cleansed from the impurities and becomes white; it is then boiled, and afterwards passed through a sieve or strainer.”

² See *ante*, p. 771, No. 4.

Nottez qu'il faut que au préalable, la pièce que l'on veut dorer soit blanchie sept fois avec blanc d'Espagne et colle de parchemin assez forte,¹ laquelle pièce on adoucit avec un linge mouillé dans de l'eau clair, puis on la racle ou oppresse pour la rendre unie. Ainsi faite, on passe par dessus deux fois de la ditte assiette cy dessus, laquelle estant seiche, on la torche d'un morceau de frise, et lors que l'on y veult appliquer l'or, on la mouille d'un pinceau avec de l'eau claire a mesure qu'on applique l'or, puis on laisse seicher le dit or, lequel estant seicq, on le pollit avec une dent de chien ou de loup, cela fait on a un très belle or bruny.

Si d'avanture il y a quelque faute à l'or après qu'il est poly, on y remette un morceau d'or, qu'on fait tenir avec le hasle puis se pollit.

Pour employer l'or poly et bruny sur le cuivre, il faut premièrement polir le dit cuivre et le faire rougir, afin d'appliquer l'or avec le caillou, et puis il le faut recuire, ce que l'on fait en mettant 2 ou 3 couches, l'une sur l'autre, et en le remestant toujours a feu de charbon leger pour le polir, et lorsque l'on l'applique sur de la ou sur du papier, le dent de bœuf du devant y doit servir.

Or mat pour faire or de couleur.—Il faut prendre toutes les salles couleurs, et les mettre bouillir sur le rechault dans une vaisselle de terre avec de l'huile grasse que l'on prend dans le pinceliere, ainsi bouillie on le passe par dedans un linge deliez, et puis on le fait derechef un peu bouillir, et sy le dit or de couleur n'est pas assé jaune, on y adjoustera de l'ocre jaune, un peu de gros massicot et mine, le tout bien broyez ; et cela sert à le faire seicher.

Autrement : on prend boli-armenique broyez avec l'huile de

¹ *Note marginale.*—On degresse la colle auparavant que de la mettre bouillir avec des cendres et de l'eau chaude, en la lavant très-bien tant qu'elle soit toute nestoïée de son ordure, et devenue blanche ; puis on la fait bouillir, et la passe par après dans un balot ou dedans une couloire.

seed or nut oil, and when gold is to be laid on the mordant, it must be neither too moist nor too dry.¹

Another way.² "Or de couleur" is made with yellow earth or ochre, with a little white lead (to make it more similar to gold in colour), which is left to thicken on the porphyry, stirring it morning and evening lest it should skin over in drying. This mode is the best, because fire tarnishes and obscures the gold.

The "or de couleur" may be exposed to the sun in order to make it dry more quickly.

1. To make beautiful "or mat," a half dry brush must be passed over the "or de couleur," so as to freshen and render it fat and shining (that is, supposing the "or de couleur" is laid over the subject to be gilded).

2. Fat oil is very good if added to the "or de couleur," as it makes it brilliant and shining. Also, if a coat of this oil be passed over the "or de couleur," when it is half dry, it will produce a gold as brilliant as burnished gold.

3. Observe, that the "or couleur" must be nearly dry before the gold is laid on it, otherwise the gold would become dull without any brilliancy or splendour.

4. To make beautiful "or mat," such as is seen on mirrors. The subject to be gilt must be whitened in distemper, in the same manner as for burnished gold; you must prime it with oil, using some very drying colours, and when dry you must pass over it some new and fat nut oil, and then apply the gold at the proper time.

To make very good varnish for varnishing gold and all other things.—Take benzoin, and grind it as finely as possible between two pieces of paper, then put it into a phial and pour on it some very good spirit of wine, which must cover the benzoin to the depth of 3 or 4 fingers, and leave it in this state for a day or two; then to half a phial of this spirit of wine you must add 5 or 6 blades³ of saffron, slightly bruised, but not broken in pieces.

¹ Note by the Author. "This size [assiette] is very good on marble."

² Note by the Author. "M. Thiesson the painter."

lin ou de noix, et quand on veut mettre l'or dessus le dit assiette, il faut qu'elle ne soit ny trop seiche ny trop humide.

Autrement : or de couleur se fait avec de la terre jaune, ou ocre avec un peu de blanc de plomb (pour le rendre plus aprochant de l'or) qu'on laisse engraisser sur le porphyre en le remuant du matin au soire, de peure qu'il ne s'y face des peaux. C'est [cette] manière est la meilleure, parceque le feu fait ternir l'or et le rend obscure. Aussi on peut mettre ledit or de couleur au soleil pour le faire plustot engraisser.

1. Pour faire de bel or mat, il faut passer par dessus l'or de couleur avec une brosse estant a demy seicq pour le rafraichir et le tenir gras et luisant (cela s'entend quand il est couché sur la pièce qu'on desire dorer.)

2. L'huile grasse est aussi très bonne dans l'or de couleur, pour le rendre beau et luisant ; aussi, passant une couche de cest huile par dessus l'or de couleur estant a demy seicq, cela fera un or fort esclatant comme or bruny.

3. Nottez, qu'il faut que le dit or couleur soit quasi seicq auparavant que d'y appliquer l'or dessus, car autrement l'or deviendroit tout morne et sans esclat et splendeur.

4. Pour faire de bel or mat comme l'on void de les miroirs, il faut blanchir en destrampe la piece que l'on veut dorer tout ainsi que l'on fait pour l'or bruny ; puis il faut prendre des couleurs fort seccative pour l'imprimer en huile ; estant seicher il faut repasser par dessus avec de l'huile de noix qui soit nouvelle et grasse, puis appliquer son or en temps et heure.

Pour faire de très beau verny pour vernir l'or et toute autres ouvrages.—Il faut prendre benioin, et le broyer le mieux qu'il sera possible entre deux papiers, puis le mettre en quelque phiole, et y verser dessus de l'eau-de-vie très bonne tant qu'elle passe le benioin de trois ou quatre doigts, et le laisser ainsi un jour ou deux, puis on y adjoust pour demye fiole de telle eaue de vie cinq ou six brin de safran legerement estampé et tout

³ Brins de Saffron. The hair-like filaments of the saffron is the part in which the colouring matter resides.

When you have done this, strain it, and varnish with it something that has been gilt, which will then become very beautiful and shining; this varnish will dry quickly, and will last several years. Now, if it is wished to apply silver in the way in which gold is laid on, common white salt must be used instead of saffron. This varnish is very good for varnishing all things, as well painted as unpainted, such as tables and boxes of nut tree, ebony, &c., gilt or not gilt, or copper, for it causes to shine, preserves, and brings out colours, dries quickly without contracting dust or dirt, and may be cleaned with a cloth or fox-tail.

*To make a varnish with mastic for oil paintings.*¹—Take 2 ounces of hard mastic and 1 ounce of huile de sapin, put the last into a small new pot, melt the mastic over a slow fire, then add the oil, which must boil when mixed with it, and must be kept boiling very slowly; for if it were to boil too fiercely, the varnish would become too viscous. To know when it is done you must dip a hen's feather in it; if this is burnt, the varnish will have been sufficiently boiled; then pour it into a phial or bottle to preserve it from the dust. When required for use it must be warmed in the rays of the sun.

Fine varnish² is made with turpentine melted over the fire; when melted, remove it from the fire, and add oil of spike with mastic, and, if required, sandarac.

Gros³ [vernis] is made with turpentine, oil of turpentine, and resin, melted up together.

¹ Varnish of Benzoin. *Note by Author.* "Le Sieur Alexis Piemontois."

entiers ; ce fait on le coule, et d'un pinceau on en verni quelque chose dorée, laquelle devient très belle et luisante et seiche incontinent durant plusieurs années. Or si l'on veut accomoder l'argent comme l'or, au lieu de safran on y met du sel commun blanc, le dit verny est très bon pour vernir toutes choses tant peintes que non peintes, et aussi pour faire reluire les tables et coffres de bois de noier, d'ebene, et de toutes autres choses, pareillement aussi ouvrage de cuivre dorée et non dorée, car il fait reluire, preserve, ayde aux couleurs, et se seiche incontinent sans recevoir pouldre, n'ordure ; et se peut nettoier d'un linge ou d'une queue de renard.

Pour faire verni de mastic pour mettre sur les peintures faites en huile.—On prend deux once de mastic ferme, et une once d'huile de sapin ; que l'on met dans un petit pot neufve, on fait fondre le mastic a petit feu, puis on y adjouste l'huile qu'on laisse quelque peu bouillir en le meslant tousjours afin qu'il ne bouille presque pas, car s'il bouilloit fort le verny deviendroit trop visqueux, et pour scavoir s'il est cuit, on met une plume de poulle dedans le pot, et si elle se brusle incontinent c'est signe qu'il est fait, puis on le met en quelque fiolle ou bouteille pour le garder de la pouldre, et quand on s'en veult servir, on le met au soleil pour l'eschauffer.

Le fin verny se fait avec de la terebantine que l'on fait fondre sur le feu, puis on la retire, et on y met de l'huile d'aspic avec du mastic, ou si l'on veult on y met du sandarac.

Le gros se fait avec de la terrebantine, huile de terrebantine et poix resine, le tout fondu ensemble.

² *Note by Author.* " M. Thiesson."

³ The *Vernice grossa* of the Italians. See also Pierre Pomet, *Histoire Générale des Drogues*, Vol. II. p. 64.

EXTRACTS
FROM
AN ORIGINAL MANUSCRIPT,

ENTITLED
STORIA DELLA ORGANIZZAZIONE CIVILE DELLE BELLE ARTI
IN VENEZIA PER SERVIRE AL PIANO DI SISTEMA
STABILE DI QUESTA IMPERIALE E REALE
VENETA ACCADEMIA. AN. 1833.

BY
SIG. GIOVANNI O'KELLY EDWARDS,

OF
VENICE.

SIG. EDWARDS'S MANUSCRIPT.

PRELIMINARY OBSERVATIONS.

THE consideration which induces me to publish these extracts is, that they treat of the restoration of the paintings of Venice from injuries arising from damp, moisture, and other causes, which probably have a similar operation in England.

This restoration by Sig. Pietro Edwards has been noticed in the Art Union. I endeavoured to learn the method adopted, but the extracts I was able to procure relative to this subject are extremely meagre.

The author of this MS. is the only son of Sig. Pietro Edwards, to whom the restoration of the public pictures of Venice was entrusted.

Sig. Pietro Edwards practised the art at Venice, and was employed by that jealous Republic, and subsequently by the Austrian Government, in restoring the public pictures. He died in 1821, at the age of 76, and is still remembered with esteem for his knowledge, skill, and integrity. The family were originally English, and lay claim to more than noble descent, but both father and son were born in Venice, and the circumstance of the father having been employed by the Government in the restoration of the national

pictures, shows the estimation in which he was held by those whom it may be presumed were competent judges. Sig. O'Kelly Edwards was also employed in their restoration under the superintendence of his father.

It appears from the statement I have made in the general Introduction, that the art of restoring pictures is now practised in the north of Italy by professors of skill and eminence. I have noticed Sig. Fidenza as having practised this art all his lifetime; and when I saw him he had been engaged in this employment at Milan for thirty-six years. These professors are not only employed by private individuals, but by the Austrian Government, in cleaning, repairing, and restoring the national pictures. The art has in some cases descended in families; and I have scarcely a doubt but that many of those who now practise it, either from tradition, or from the accidental discovery of MS. recipes, or from both, and from some of them having analyzed the materials used in these old paintings, possess the knowledge, which they claim, of having ascertained the pigments and vehicles used by the great Italian masters, and the mode of their use and application.

The MS. from which the following extracts were made was written by Sig. O'Kelly Edwards with a view to publication; but in the Venetian territories works on the fine arts are not permitted to be published without especial permission from the Academy of Venice. This permission was refused; but the authorities at Vienna, to whom the MS. had been submitted, directed that a copy of it should be made and preserved in the Academy at Venice. I saw this copy among

the Edwards' papers in the office of the secretary of the Academy.

The first part of the book contains the history of the several academies of painting, &c., in Venice.

The beginning of the second part gives an interesting account of some of the public pictures; of the search that was made for some that were missing; and of the collecting of the best pictures from all parts of the Venetian territories, in order to form a public gallery at Venice, which should show the rise, progress, and decline of the art. The extracts contained in the following pages which treat of the general restoration of the public pictures under the direction of Sig. Pietro Edwards, and of the causes of their decay, are from this part of the work.

Sig. Edwards relates that his father, in 1776, restored the only picture painted in distemper on a wall by Paolo Veronese. This painting is on the ceiling of the Collegio in the Palazzo Ducale; it is still in existence, but is in bad condition.

In 1777 Sig. Pietro Edwards painted the head of the principal figure in Titian's beautiful picture of "Faith" (now in the Sala delle quattro Porte), which had been cut out and carried away; and so well has this been done, that it is impossible to detect the part newly painted, and as his son observes, neither the French Commissioners, who removed the picture to Paris, nor the painters of that country ever detected the modern work. Sig. P. Edwards also painted the head of one of the Magi in the "Adoration" of Bonifazio, which had likewise been cut out and stolen.

The number of public pictures restored by Sig.

Edwards, and those who worked under him, between the years 1770 and 1817, amounted to upwards of 759.

The third part of the work is uninteresting to the English reader, and therefore has not been transcribed.

In consequence of a report from England, which reached me when I was in Venice, that Sig. Pietro Edwards had discovered the old method of painting in oil, and had sold his secret to the Government, I endeavoured to ascertain whether this was the fact. By the kindness of the Count and Countess Spiridion Papadopoli I obtained permission from the President of the Academy to inspect the papers left by Sig. P. Edwards, which are preserved in the Academy, and, from what I saw there, I am enabled to state my firm belief that no secret was either bought or sold; but I saw among these papers much interesting matter relative to the restoration of pictures, which would be extremely useful, and of which Sig. O'Kelly Edwards promised to send me copies. I have reason to expect the Venetian jealousy has interfered, and that Sig. Edwards has been prevented from performing his promise. Fortunately, however, while I was looking over the papers at the Academy, I employed my son in making extracts from some of the most useful parts, translations of which will be found in the notes.

As this MS. is rather historical than technical, I have thought it unnecessary to publish the original text.

ON THE RESTORATION OF THE ROYAL PAINTINGS

UNDER THE
VENETIAN GOVERNMENT.

FROM the year 1725 to the year 1775 no less than 751 Reports of the College of Painters, concerning the necessity of the restoration of the public paintings, are enumerated. All these mentioned the gradual decay of the pictures, and in each the attention of the public was earnestly called to this subject, and to the urgent necessity of repairing the greater part of them, and of restoring them to their ancient lustre and splendour.

A fact authenticated by so great a number of depositions, and attested not on the credit of a few intelligent persons only, but by the common consent of the professors of the art, determined the Venetian Senate to consider the subject of a general restoration.

And although the individuals, the Government, and the members of the above-mentioned College were changed, this feeling still remained constant in the minds of the good citizens of Venice, and the Government was more and more inclined every day to attend to the public remonstrances.

For if, in forming their judgment on other important subjects, the Senate relied on the opinion of one or two persons skilled in the various questions upon which they were sometimes required to decide, it could have had no difficulty in deciding on this subject, which was supported by the opinions of a long succes-

sion of men, all agreeing on the same point, and incapable of entertaining views of promoting private interests.

Nor could there be any doubt of the integrity of these men, because the business of restoring paintings was not, at that time, an employment to which masters of any reputation applied themselves, but, on the contrary, the society of which these were members, experienced continual difficulties and embarrassments on that account.

It may be said that the names alone of Sebastian Ricci,¹ Lazzarini,² Balestra,³ Tiepolo, Trevisano, and many others, were

¹ Sebastiano Ricci, or, as he was called by the Venetians, Rizzi, was a native of Belluno; he was born in 1659 or 1660, and died in 1734. He painted in Venice, Milan, Bologna, Florence, and Rome; and traversed every part of Italy, where he accepted every commission and any terms he was offered. He afterwards visited Germany, England, and Flanders, where he perfected himself in colouring. "In such a variety of schools," says Lanzi (Vol. III. p. 225), "he filled his mind with beautiful images, and copying many, he familiarized his hand with different styles. Like Giordano he possessed the power of imitating every manner, and several of his pictures, after Bassano or Paolo, have deceived many, as was the case with one of his pictures at Dresden, which was attributed to Correggio." In addition to this power of imitating other painters, a most admirable and essential qualification for a restorer of pictures, he possessed excellences which were peculiarly his own, and which entitled him to rank highly among the original painters of that period. Zanetti, della Pittura Veneziana, p. 437, observes, "if his pictures have in some degree darkened, the fault must be attributed to the bad preparations of the canvas and colours which were in use at that period."

² Gregorio Lazzarini, the scholar of Rosa, whose dark style he repudiated and banished from the Venetian school, of which, for the correctness of his design, he may almost be considered the Raffaele. At first sight it might be supposed he had been educated at Bologna, or rather at Rome. Lanzi says he was never out of Venice, but Moschini^a proves that he was a scholar of Girolamo Forabosco at Padua. His genius secured him the esteem of the most learned professors of the art, and especially of Carlo Maratti, who had but little respect for his contemporaries.

It is related "that the Venetian ambassador at Rome, having proposed to Maratti to paint a picture for the Sala del Scrutinio, he refused the employment, expressing astonishment that they should seek him at Rome, when they had a Lazzarini at Venice; and well did Lazzarini answer the

^a Moschini, della Origine e delle Vicende della Pittura in Padova, p. 120.

sufficient to authorize this decision, but to these were also added the evidence of the eyes, and the voice of all the citizens of taste.

For if the public could be persuaded of the necessity of a general restoration of their paintings fifty years previously, how much more should they be of this opinion in 1770, when the damaged pictures showed visible signs of decay, and it was feared that they would be entirely lost; and when people spoke no more of the impending destruction, but of the ruin which was already visible!

The disadvantages of this otherwise excellent climate, and their destructive influence on manufactures and natural productions, are well known; for even marbles, metals, and the hardest articles are injured, and the action of the moist and saline particles of our atmosphere is particularly visible on the colours, and on the soft and porous grounds of canvas and panels on which these colours are used, and which are well adapted for the reception and retention of the minute particles which are introduced with the air.

From this action of the atmosphere in diminishing the resistance of the glutinous parts, which consequently crack and cease to hold the colours in strong cohesion, it would follow

expectations formed of him by Maratti in two pictures he painted in this apartment, in memory of the triumph of Morosini, surnamed 'Il Peloponnesiaco.' But he particularly signalized himself in the picture of S. Lorenzo Giustiniani in S. Pietro di Castello, which is, perhaps, the best picture in oil that the Venetian school has produced in this century for the taste of the composition, the elegance of the contours, and the originality and variety of the faces and attitudes. It is also distinguished for the force of the colouring, in which he was not always equally successful." This picture is still in excellent preservation. The date of his death is uncertain: some authors say it took place in 1730; others not until 1740.

³ Antonio Balestra, born at Verona in 1666, died there in 1740. He painted in Venice, where he was much esteemed. His Nativity, in the Convent of La Carità (now the Academy), and the Deposition from the Cross, may compete with the best paintings of the age. His S. Vincenzo is one of the best preserved of his pictures; for his method of painting with boiled oil has spoiled not a few. Those painted with oil less boiled have changed less. Lanzi, iii., p. 230.

that after the lapse of a certain time, pictures would be more deteriorated in a few years, than during a period three times as long as that which preceded it.

This natural reasoning, proved by experience, removed all perplexity from the Venetian Government, and perhaps from this they concluded that the restoration required by the greater part of the works of the Venetian masters not having been properly effected since the year 1725, the pictures should naturally have suffered more injury during the last fifty-two years (from 1725 to 1777) than in the previous century and a half, and that therefore their condition required immediate reparation.

It was, however, very fortunate that the Government should have acted with great circumspection until the year 1777, in consenting to the general and universal restoration of all the royal paintings, because the art of repairing paintings damaged by time had not then obtained perfection, and the greatest painters considered the employment as beneath their dignity, and projected it merely with a view to obtain some office which might confer honour on themselves. The reparations, therefore, fell to the lot of the unemployed artists, who are generally the worst, and who, when there was no part of the picture to be entirely removed, thought that any indifferent painter was equal to washing, strengthening, and introducing the proper juices for restoring the picture to its ancient beauty.

In fine, a catalogue of the pictures, which were in a state requiring immediate restoration, being ordered in 1727 [to be prepared, the number was found to amount to twenty, and the Society of Painters selected Sebastiano Ricci to restore three of those which required renovation, while, for repairing the others, they nominated five other painters, who worked very badly, and whose existence would, perhaps, never have been known, had not these works been spoiled by their hands.

It is not, however, wonderful, that even among professional persons such miserable blindness and wrong notions should have prevailed. The art of repairing paintings damaged by the injuries of time was new to the world, and, until this period,

nothing was known of it beyond the occasional necessity of repairing rents and superficial blemishes and the corrosions which, at that date, the pictures had only begun to suffer from the hidden ravages of time.

Necessity introduced the arts, and the art of restoring the works of the pencil from the decay to which they were liable from age could not arise unless pictures grew old and lost their beauty: therefore different modes of restoring them to their former state were tried.

The learning and skill necessary for such a profession, following the common order of things, were acquired by gradual steps only; meanwhile public faith and the innocent error of the painters themselves kept occupied a few devastating hands, who left behind them much cause for grief.

At last the eyes of men were opened, and by long and continual experience it was discovered, that the restoration of ancient paintings was not a work of such small importance as to be entrusted to the hands of any person; for it was sometimes found that the most gentle washes would determine the fate of a painting, and some operations, after the ephemeral splendour of a few years, accelerated the destruction of the pictures, and it was discovered that it did not require less knowledge to restore the paintings to their pristine state, than skill to paint them.

This last observation, which, on the authority of the before-mentioned Ricci, passed into a proverb among those who followed this profession, elevated the study of the art of restoring paintings among the Venetians. One after another, all professors of merit aspired to it; and although the first trials showed that the art was not yet well understood, yet the second errors were far less dangerous than the first.

It was here, however, that party enmity broke forth in the Society of Painters. The manifest necessity of restoring the Venetian paintings, and the already declared desire of the Government to repair them, gave rise to the belief that the period of some decisive resolution was not far distant; meanwhile the

watchful crowd of artists, who saw themselves in danger of being ungraciously dismissed from their high stations, was anxiously expecting this moment, and with all the cunning which can be found in the idleness of the unemployed, and which human sagacity, sharpened by poverty, can suggest, they endeavoured to determine the event in their favour.

On the first announcement that there had been some deliberations on this subject, it is impossible to describe the ferment which was excited in that agitated circle, in order to carry into effect their preconceived wiles. Hence it arose that men intruded themselves into the works of restoration, who had no right but that of their own temerity, and who endeavoured to evade the prudence of the person who presided, and to obtain by trickery a consent which it was easy to procure in the confusion of such intricate and violent practices.

Thus were united, to the injury of the ancient Venetian paintings, first the errors and afterwards the monopolies of those same artists, who themselves would be most injured by so deplorable a ruin, and this was certainly the principal reason why the public mind vacillated for seven years (from 1770 to 1777), uncertain which course to pursue.

Nevertheless, as to abandon entirely the restoration of the public paintings would have been the same as to lose them entirely, three decrees were promulgated which contained orders to provide for this event, and the direction was entrusted to Commissioners of high rank. These were afterwards five in number.

It is difficult to understand (but the fact is nevertheless well proved) why all the authority and vigilance of the Venetian Commissioners up to the above-mentioned epoch were insufficient to form a regular system of public restoration, since the authority of the Commissioners themselves, and the intervention of the Society of Painters, armed both parties.

This Society, called in the year 1770 to give its vote confirmed by an oath on this affair, did justice to Bertani, a most useful man at that time, and the first who instituted a good

mode of restoration, whom the Senate had praised for having restored the ceiling of Paolo [Veronese] in the room called the "Sala della Bussola," for which work he was paid 220 ducats; yet, with all this, such were the underhand dealings, that at last even this honoured artist protested against his commission if it were to be obtained by such means, and if he were to be dependent on the whole band of his competitors.

It was evident, therefore, that the assistance of this great painter was only to be obtained through the interposition of the Society of Painters, and that everything would end badly if they could not be induced to agree together, and if, to promote their own private views, the contending parties continued obstinate in not proposing useful means for proceeding. This was the motive which at once put an end to the designs of the Senate and the activity of the plans set in operation for effecting the general restoration; nor did it produce any matured arrangements for rescuing the pictures from the long threatened injury to which they were subjected first by the ignorance, and afterwards by the artifices and poverty of the artists.

If, however, the great necessity for restoring the celebrated paintings of the Venetians from the damage which had arisen from natural causes and from the injuries which they had suffered from the inexperienced hands of those who had operated on them, and the intrigues by which the best provisions were frustrated, had not been motives strong enough to determine the formation of a well-arranged system relative to the before-mentioned general restoration, there ought not to have been any hesitation on the subject, considering the quantity of money which had been thrown away, the dishonour with which the native glory and credit of Venetian genius was tarnished, and the disadvantages to which it subjected the liberal arts.

It is true that the pecuniary value of these precious paintings has no regular standard, and that their real value consists principally in the combination of social circumstances; the Venetians should, therefore, for this reason hold their national and classical pictures in the highest esteem.

If the half of a painting by Titian, which was at one time in a church of this city, and which was reputed to be almost ruined, was sold by a dealer for 8000 ducats; if a single picture by Paolo [Veronese], the greatest ornament of a noble house, was desired by a rich stranger at the price of 20,000 ducats;¹ and if more than 70,000 ducats were paid at that time to the Duke of Modena² for his collection, which consisted chiefly of small paintings; most certainly a very great sum was worthy of being spent on the wonderful pictures possessed only by the then Government of Venice.

What must have been their value, for such property could not be valued according to the rules by which the treasures of private individuals and the wealth of merchants are determined, but as gems destined to enhance the splendour of the royal crown of a sovereign?

Small indeed is the sum, in this view of the question, of a few thousands disbursed in the course of many years, with the object of recovering riches to the amount of some millions, and maintaining the public dignity, which could not certainly be adorned by more beautiful ornaments than those created by the genius of her sons.

¹ The Family of Darius at the feet of Alexander, in the Cà Pisani. This exquisite picture is in a perfect state of preservation: the colours appear to have undergone but little change; the flesh tints are beautiful, and the whites quite fresh. Sig. Edwards informed me it had been restored by Bertani in 1778, under the superintendence of Sig. Pietro Edwards, his father; that it then required but very little reparation. It was lined and cleaned, and some small touches of colour were replaced where necessary; the blue sky, which had been painted in oil, was restored to its original colour, and the picture was re-varnished, and since that time the varnish has never changed, but the blue sky has again acquired a slight greenish tinge. Sig. Edwards told me the colour used for the sky was "Turchino," not ultramarine. The high degree of preservation in which this picture now is, may, perhaps, be partly attributable to the fortunate circumstance of its having always remained in the same family, to its being hung on an internal wall of a room apparently always inhabited, and, above all, to the prudent resolution of the owner not to allow either whole or partial copies to be made of it, on account of the destruction of so many first-class pictures by copyists.

² This collection is now in the Dresden Gallery.

For these reasons it may be remarked, that as one cannot judge of the greatness of the genius with which a nation is endowed from the secret resources of that nation, but from those objects which it most esteems and which are visible; so the rivals of the Venetians, from the general abandonment of so many sublime works, which had been the objects of their studies, would have had a very good argument for deductions rather unfavourable to that people.

Well and wisely, then, would the Venetians have acted if they had bestowed all their care in forming a certain system of public restoration of their splendid paintings, which, besides being the object of an almost superstitious veneration, had been frequently sought for with so lavish an expenditure of gold, by those to whom nature had denied a Titian and a Paolo, and which had so gloriously contributed to the national renown, and which deserved to be respected, not only from gratitude, but also from the precious deposit of fame which their authors had confided to the fidelity of their country.

Nor could the Venetians allege in excuse the sanguinary incursions of barbarians and the perversion of political systems, which have been cited by some nations as apologies for the state of decay to which the famous pictures of the ancient masters were reduced; nor can they exculpate themselves by pleading that the decline of taste was occasioned by the great number of excellent works left them by their native authors of the golden time. The humiliation of the Venetian genius would have been further increased by neglecting to restore them to their ancient beauty, and the indifference they showed concerning their absolute destruction.

On the contrary, we will say something more, namely, that the custody of the pictures being at that time entrusted to persons who had little love towards the fine arts, specimens of them are very rare which are not either blackened, torn, badly situated, badly repainted, or in some way or other entirely spoiled; and for this reason the public testimonies of such neglect would have authorized the universal contempt, the increasing perver-

sion of taste in painting; and would also have put an end to the wonder of those who could not perhaps understand how, with the flattering applause of strangers, nearly all the rich galleries of the state should have been emptied in less than seventy years; and that only a very few private collections¹ should still

¹ The principal private collections now existing in Venice are those in the Manfrini and Barberigo palaces. Among the latter are the *Magdalen of Titian*, and his *St. Sebastian*, left unfinished by this great artist, who was working on it when he was attacked, at the age of 99, with the plague. For those who are desirous of studying the method of Titian, there cannot be a better opportunity than that afforded by this picture. It should be studied with the work of *Boschini* in the hand. In the sky, on the left of the Saint, may be seen, distinct and unsoftened, those vigorous touches of terra-rossa, ocrea, biacca, and nero, of which he speaks. The distant landscape, bounded by mountains, and a group of trees in the background, are merely indicated. The face and head are finished, the colours on the upper part of the body have been repeated, but the rest of the body is merely an "abbozzo." It is easy to see, from the length and boldness of the strokes, that the artist used a large brush when painting, and stood at a distance from the picture.

Most of the pictures in this collection are injured by cleaning, having apparently been washed with some solvent, such as spirits of wine or an alkali, which has removed all the glazings, which have never been replaced. From this cause all the pictures in this collection by the *Bassani* resemble pictures in distemper. The removal of the glazings also gave me an opportunity of remarking that the dark leaves of the trees, and other extreme darks, as well as lake drapery, &c., in a picture by *Tintoretto*, were painted with colours mixed with varnish, while the rest of the picture looked dull; and I cannot help thinking that as these colours mixed with varnish resisted the action of the corrosive liquid which had been applied to the picture, an oleo-resinous varnish must have been used.

The *Magdalen* by Titian has suffered much from copyists, who have applied oil and other substances to it in order to see to copy it. The celebrity of this picture may be estimated by the fact, that one artist employed himself solely for eight years in making copies of it. In return for the liberality of the nobleman who had granted him this indulgence, the artist injured the sky by the tricks he employed to develop the colours, to such an extent, that he thought it necessary to repaint it, in order to conceal the mischief he had done. This part of the picture does not now harmonize with the rest.

The *Venus* also has been much injured, and part of it appears to have been repainted. Part of the drapery has changed to a dull flat black, all the lights and shades being lost, apparently by the action of some chemical application.

remain embellished with the dusty remnants of this art, banished from the dwellings of the nobles.

It has been already observed, in the first part of this work, concerning the organization and state of the arts, that at the epoch of which we are speaking, the spirit of frivolity having put an end to the cultivation of high art, works of puerile taste were substituted, which stamped with dishonour the character of the eighteenth century ; that the few good artists were driven to starvation, or to follow the common plan ; that the growing and youthful nobility, who should have been able to promote the arts, continued to form the first notions of artificial beauty, both simple and sublime, from the study of the productions of the puerile, the ridiculous, and the hyperbolic style which, by a strange fascination of the mind, was then admired ; and that thus artists and their patrons joined hand and heart in ruining the genius of the nation while they cultivated the arts.

As little or nothing, therefore, could be hoped for in these bad times, or in those which were preparing, no hopes remained of the renaissance of the Venetian School, which, in the short space of a few years, had entirely lost not only the original art itself, but those persons who could direct the taste of the artists ; the characters of its lost style could no longer be distinctly traced, and that number of examples which pointed out the various paths of excellence to native genius, were rapidly decaying.

But the loss of the Venetian paintings which would have ensued through not organizing a system for restoring them, would not have produced the above-mentioned injuries only. In the rise and decline of painting is also included the history of the progress and decline of nearly all the inferior arts which are derived from it, such as the laws of well-adjusted design, the judicious choice of forms, and the various imitations of natural and artificial beauty.

The art of painting has always influenced the productions of the chisel, and all kinds of work in which enthusiasm and

the inventive faculties take part, and the pictorial discipline influences more than all the rest the general taste of the people, presenting to it lasting lessons, which are understood even by idiots; encouraging that delicacy of finish and neatness in the manufactures of industry, which, when they are brought to the highest degree of perfection, are said to be *executed by the pencil*, and, to use the words of Buonarotti, fixing the compasses of elegance and proportion in the eyes of artists.

The destruction, therefore, of the pictures of this State, which might by some be considered the object of idle and superfluous cares, would have occasioned the universal ruin of those social arts which are based on design, a misfortune so much the greater because it would have happened at the period of the general decay of these arts themselves, and at a time when voices were heard from other regions inviting them to leave this their ancient dwelling.

These considerations were of greater weight than all others, because the nearer the danger, the greater was the force of envy, and the value of the monuments of native genius which might still be saved, and so much the more was it the duty of the Venetians to put in operation the most active and efficacious measures for promoting the arts.

It ought, however, to be observed, that without the appointment of a Director well skilled in the Arts, especially in the theory and practice of the different styles of Venetian Painting, the regulation concerning the restoration of the public paintings would always have been essentially defective. This was ultimately determined in 1778.

If the system of a general restoration had been confided to any other person, even though he were a man reputed very learned in the art, it might be believed that such a knowledge would extend to the proposing of a method of external custody only; and thus the different examination of various buildings in which the pictures were contained, the best defences from accidental injuries, and other similar provisions, would have

formed the sum of what was to be changed and what to be established.

But when the contrary to this had become well known, and the fact of many unfortunate experiments, before the time of Bertani and Diziani,¹ had proved that the art of restoration had not yet attained any certain method and science, the Venetian Government entrusted to the most learned person conversant with the art the whole undertaking (more important than any previous system partially effected), the object of which was to retard the decay of the Royal paintings as much as possible beyond the natural course of things; and this may truly be called preservation.

But although these researches reflected so much honour on the Government, they were equally calculated to perplex every man of honour, how well soever he might be informed on these matters. On the one hand, there were no authorized instructions of classic artists, no example of successful experiments conducted on good methods; and on the other, it was useless to say that the paintings were perishing because no one knew how to restore them. Hence, while the biting irony of empirics in painting, who mysteriously pretended that they alone knew what was unknown to all others, grew louder, great difficulty

¹ Gaspero Diziani, of Belluno. He was a pupil of Sebastiano Ricci, and a scene painter, in which branch of the art he had great facility. He also painted cabinet pictures which were much esteemed.

The following extract from the Decree of the Venetian Senate of the 3rd Sept., 1778, for restoring the pictures in the Ducal Palace, will show the estimation in which Bertani was then held:—

“The Senate having maturely considered that it was not prudent to entrust so decisive and important, but necessary, an operation to the plan proposed by J. —, and being aware of the difficulty and risk of selecting a person of reputation and experience skilled in the most difficult art of restoring the injured paintings, hereby declare it convenient and in accordance with the express sentiments of the same conference, and with a perfect knowledge of the ability and probity of Prof. Giuseppe Bertani, proved on several occasions, to appoint him, in conjunction with his two usual associates Baldassini and Diziani, to be assisted by them only, to execute this important task,” &c.

was found in making every one understand the theoretical reasonings and practical observations which could undeceive the minds of people, confine their hopes to more just measures, and justify the moderation of those who only promised what could be expected from the limited strength of human ingenuity.

However, at this period the Venetian Government began to place much confidence in the President¹ of the College of Painting. This person, who had opposed the decision of ten artists who had condemned as irrecoverable, and who had proposed to remove, the only work in tempera painted on a wall by Paolo Veronese on the ceiling of the college of the ducal palace,² undertook, in the year 1776, to save this splendid work from impending destruction, and to restore it to its pristine splendour. The improvement he effected may be estimated by comparing with the present appearance of the picture an apposite description of it by the pen of the President of the College of Painting, which is still preserved; for without his ingenious operations and certainty of result, this painting most certainly would not now be in existence.

About the year 1777 occurred the robbery of the head of the celebrated Faith, painted by Titian, and now existing in the "Sala delle Quattro Porte," and the Senate had recourse to the

¹ Sig. Pietro Edwards, the father of the author of this work. Sig. Pietro Edwards is mentioned in the decree of the 3rd of Sept., 1778, in the following terms:—"The already suggested appointment of an inspector of intelligence and of tried probity, who, with attention and care, should assist this work and decide on the quality and merit of the works, being of equal importance, the Council has therefore determined to intrust this important charge to Sig. Edwards, the other Professor, who alone is considered worthy to fulfil so delicate a task, having already shown his ability in various operations, and especially in the public work of restoring the ceiling by Paolo Veronese in the Sala dell' Anti Collegio, then in danger of perishing, and who was by the Senate, in preceding decrees, acknowledged honest and skilful, and who has obligingly consented to accept the employment for certain considerations."

² The picture is still in existence and in its original situation, but it is much injured.

It appears from the description by Sig. Edwards of the state of this picture in 1776, that it was in danger of falling in pieces from the ceiling, and that Sig. Edwards secured it in its situation by a multitude of iron cramps.

same (not mercenary) pencil to supply this loss ; nor could the French Commissioners who transported it to their country, or the painters of that country, ever discover the modern substitution.¹ In the same manner the pencil of this person had, with exact imitation of style, filled up the empty space remaining in the Adoration² of Bonifazio, by inserting the head of one of the Magi which, at about the same epoch, had been cut out, perhaps by the same hand that had had the opportunity and audacity to cut out that other most beautiful head of Faith.

These and other experiments, as well public as private, which had satisfied the minds of learned observers, added to the notoriety of his profound theoretical knowledge and superior probity, determined the Venetian Senate to trust the undertaking of the general restoration to the President of the College of Painters.

It was required to preserve 92 paintings of Paolo, 57 of Bonifazio, 41 of Giacomo Tintoretto, 11 of the best of the Bassani, and a few by the great Titian, with many others by various classical masters, in all 405 pictures, which were restored between the years 1779 and 1785. These pictures were contained in thirty-two public buildings in the districts of St. Mark and the Rialto ; after which 270 more were restored, between the last-mentioned period and the year 1788, under the direction of the same person, making a total of 675 public paintings restored out of 1187.³

¹ Sig. O'Kelly Edwards, the author of the MS., told me that the piece cut out of the picture was nearly square, and about 4 or 5 inches larger than the head, and had evidently been stolen for the purpose of framing. He also told me that he and another person who was then restoring pictures in the Ducal Palace, procured a ladder and examined the picture ; that the seams where it was joined can be felt on the back of the picture, by pressing it against the wall. I went purposely to see this picture twice, but from the distance at which I stood, it was impossible to detect any difference in the tone of the colours, or to distinguish the seams. This fine picture is injured in many places, and appears to be decaying fast. The paint is scaling from the canvas in many of the dark parts.

² The Adoration, by Bonifazio. This picture is now in the Academy at Venice.

³ The expenses incurred in the restoration of these 405 pictures are

In order to guide us in determining with certainty the merit of any pictorial restoration, with reference to the difficulties overcome, the propriety of the means used, and the probable success of the result, it is most essential to be fully acquainted with the three following points, namely, the previous state of the restored works, the particular nature of the paintings, and the characteristic style of the authors.

The partial or total want of these three requisites for judging reasonably of the skill, diligent practice, patient investigation, and sure discoveries, which might direct and accompany the above-mentioned undertaking, was perhaps the principal cause of the silence of the learned Venetians concerning the benefits to be derived from this public provision.

But as all agree in praising the worth and immense value of these royal pictures, and as the fact of the 751 Reports representing their perishing state is notorious, as well as their general restoration, and as there are in the public acts more than fifty written testimonials approving of this operation, so much public and private applause redounds to the honour of the art of restoring at that period firmly established.

It may be thought useful to indicate briefly some of the results of this restoration from its commencement and during its progress; these may with propriety be compared with those restorations which in later times were practised with less successful methods, and under the influence of a different management.

Almost all the pictures, therefore, which adorn the Royal ex-Ducal Palace, were preserved by the general restoration, and to this we owe the existence of the paintings illustrative of some of the most splendid events in Venetian history. The painting by Andrea Vicentino, representing the arrival of

stated by Sig. Edwards in his MS. to have been 48,595 florins, in which sum were included the expense of repairing and regilding the frames, and the sub-director's salary of one florin a day. The pictures of the first class which were restored, computed by Italian square feet, comprised an area of 6458 feet 26 inches; of the second class, 6407 square feet and 6 inches—total in square feet, 12,865 and 31 inches.

Henry III., now in the "Sala delle Quattro Porte," in the Ducal Palace, was restored to its ancient beauty, as well as that by Leandro Bassano, representing the Victorious Return of the Doge Ziani and the Meeting with Alexander III., which adorns the Council Chamber of the X.; and that other picture by Marco Vecellio, the nephew of Titian, in which is represented the Confirmation of the Peace of Italy; and, together with these, after many misfortunes, were at length repaired the paintings existing there by Bazzacco, by Paolo, by Zelotti, and by Aliense, so that they were again enabled to resist the climate and seasons.

By this general restoration were restored the greater part of the public paintings which now adorn the new public library, and which were previously injured by various causes and menaced with ruin. Among these we may cite the painting by Domenico Tintoretto, representing the Taking of Zara, and as a testimony of the well-directed restorations effected about the year 1779, the Universal Judgment by Jacopo Palma. As examples of the execution and duration of works which have remained unaltered more than half a century, we may cite the paintings of Jacopo Tintoretto, of Palma, of Dolabella in the "Sala del Pregadi," with many others which are omitted, and which form rich ornaments, and afford most excellent instruction to the learned subjects of this most peaceable kingdom.

In spite, however, of the great practice and knowledge acquired by about twenty-six artists retained in the public service during the general restoration, it was very doubtful whether the skill they had acquired would become hereditary.

It would undoubtedly have done so if they had not been very jealous of their superior information, of their almost inspired knowledge, and discoveries of secrets, especially when an opposition school was formed by some of this profession, in which most excellent future restorers, to whom the public works might be trusted, were instructed.

The best informed persons being dead, there was still less

hope that the art would be transmitted as the patrimony of posterity; nor could other expectations be entertained from those who succeeded them, who, notwithstanding the estimation to which they had been raised by the instructions of others and on account of the scarceness of other workmen, were, in fact, but idiots and mechanical artists only.

These, nevertheless, were the men who, watched over and assisted by the assiduous lessons of the Royal Inspector of pictorial restorations, continued to work well in Venice even until the year 1798-9, in restoring about eighty-two of the public pictures, and under the safeguard of the primitive Imperial and Royal Government of

AUSTRIA.

This remembrance is always a proof of the gratitude of the Venetian nation, who experienced the effects of the royal and paternal solicitude of his Majesty.

It is also satisfactory to consider, that even without the example of the Venetians, the august genius of the monarch should have not only continued, but commenced this undertaking, it being well known that the royal munificence had expended, between the years 1777 and 1781, 75,000 florins in the restoration of the Imperial Gallery.

Now all that was provided or proposed, from 1798-9 to 1805, on this subject, at Venice, through the care of the Prince Reitz, of the Commissioner and President Pellegrini, and of his Excellency Count Bissingen, was much praised, both for the prudence with which it was executed and the judgment with which it was planned, and ever afterwards for the value of the paintings, the restoration of which was the object of the attention of the Government.

Under its superintendence fifty-four paintings were restored (on the 15th of January), 1797-8, to their places in the ex-ducal palace. Some of these which, under the previous Government of Venice, had been removed for the necessary restorations were restored, and if the painting by the school of Marco Vecellio,

representing the consecration of San Lorenzo Giustiniani, is still to be seen in the Sala del Pregadi, it is owing to this superintendence. The other picture by Pietro Bellotti, representing the demolition of Margaritino, was restored to its pristine beauty, as well as the taking of Cattaro by Andrea Vicentino, in the "Sala dello Scrutinio."

These were proofs, which satisfied the Royal Government of his Majesty, that the art of restoring injured pictures was proceeding in the right way in which it had been directed since the year 1779. Additional proofs were also afforded by the two immense paintings of Jacopo Tintoretto, which were again placed in the church of the "Madonna dell'Orto" in this city; and one of which, representing the Last Judgment, had lost its colour in many places, and especially in some of the principal figures, which had been twice re-painted.

In the year 1803, the Government, after particular inspection, deliberated on the propriety of restoring twenty-eight other pictures, which had not been repaired at the time of the general restoration, and which had been much injured by the Commission for the necessary external defence.

It appears, from the notes of the Government of the 3rd of September, 1803 (No. 16,475), that—

In the Sala del Maggiore Consiglio:—

The large painting by Domenico Tintoretto, of the taking of Zara (a subject similar to that in the "Sala dello Scrutinio"), "had in many ways suffered from the weather and the previous bad restorations," which had been executed by the painter Cardinali, who had the execrable habit of re-painting old pictures with oil.

In the same apartment:—

The Apotheosis of Venice, a very large work, by Paolo Veronese, on the ceiling, "required the removal of many spots occasioned by the intrinsic change of colour and the irregular sinking in of the colours." The other two octagons painted by him, representing the Taking of Smyrna and the Liberation of

Scutari,¹ were previously "almost destroyed by the decay of the colour," and in 1803 the former "was much injured by rain water, and other causes, which had occasioned great alteration of colour," and to the same causes was attributed the decay of the picture representing the Fortification of the Isthmus of Corinth, by Leonardo Corona.

Again, with regard to the Rout of the Dukes of Ferrara and of the Germans, painted by Francesco Bassano, and the Rout of the Arragoneze, by Jacopo Tintoretto; the first is represented as "entirely decayed," the second as "obscured and injured by the rains to which it had been exposed," and there was reason to "fear that it would become worse," and it was "also torn" in several places, and "had greatly suffered by the action of water, with which it had been saturated," and, consequently, that the "necessary operations for preserving it could not be omitted." The picture of Otho, presented to Alexander III., was "dis-

¹ I had an opportunity of closely examining one of these works which had been removed from the ceiling for the purpose of being repaired. The picture had been lined, but much of it had absolutely decayed, and there were large blanks on the new canvas. The ground of the picture was extremely thin, and was not visible; the painting was much worn in places, and some of it had scaled off. The varnish also was removed except in one part, which did not appear to have been retouched. I saw that neither the blue pigment nor the lake had changed. The former was of a beautiful colour. The last colour was laid on transparently, and was deeper in the crevices than on the surface of the marks left by the brush. Vermilion also had been laid on the lights of one drapery, but it had been much rubbed, and I could see the solid painting and white lights beneath. There was a figure in the foreground with a sabre wound on the head. The blood was painted with vermilion, glazed with deep lake, which appeared *varnishy* in the darkest parts, and was of a very fine colour. There were also some lights on a yellow drapery, painted solidly and glazed with a transparent yellow resembling Indian yellow. Part of an embroidered drapery was painted with an orange colour, resembling red orpiment, or that pigment now almost unknown in Italy, called "Rauschel Minerale" (if, indeed, they are not synonymous). It was contrasted with a rich warm green, and a lake-coloured drapery of the usual bluish tint was near it. The lights of this drapery were white; the lake was glazed on the shadows, and softened off exactly as it is used in painting in water colours.

figured by the running of damp (colatura) from the top to the bottom."

Finally, we read the following remarks on the *Paradise*, by *Jacopo Tintoretto* :—" It suffered much damage from the last disaster of the penetration of the rain through the large roof. Independently of this misfortune its injuries are indescribable, and would require the hand of its author to repair them, because they are not restricted to particular parts of the picture, but extend to the general harmony, to the distinction of the masses, and to the entire effect of a composition of excessive richness, and almost entirely dependent for effect on the separation of tint and *chiaroscuro*, which are now so much altered, that they leave great doubt concerning the true and primitive conception of the master. To these great difficulties relative to the essential part of the painting, are added other serious and hazardous operations belonging to the mechanism of the work, to the necessity of cutting the picture, to the mode of reuniting it, to the uncertainty of working on the parts in a divided state, and to the difficulty of comparing the whole together previous to replacing it in the proper situation," &c.

In the "*Sala dello Scrutinio*:"—

Although the *Taking of Padua by Night*, painted by *Francesco Bassano*, "did not appear to be injured by the water which lay on it;" yet, for the sake of prudence, "it was secured with appropriate precautions from injury." The *Rout of the Pisans* by *Giovanni Michele* at the *Port of Rhodes*, painted by *Andrea Vicentino*, "was lined, and the surface of the paint fixed to the ground." The *Morea in Chains*, and the *Fame*, painted by *Lazzarini*, had "suffered great injuries, and will still suffer more from the corrosive droppings of the moisture which collects on the marbles of the architecture," such as that of which the monument of the *Doge Peloponnesiaco* (*Morosini*) is constructed. Of the *Victory gained over Ruggiero King of Sicily*, and painted by *Marco di Tiziano*, it is remarked, "great is the damage which it has received from the calcareous drop-

pings by which it is disfigured ; it appears also to be otherwise damaged.”

In the “Sala delle Quattro Porte :”—

The work of Carletto Caliarì, representing the Ambassadors of Persia introduced at the Collegio dei Savii, was restored to its present state, and to show its former condition we quote the following passage, in which it was thus described :—“ This beautiful work has contracted a general obscurity from being exposed to the sun ; and it is besides much spotted by the rain and snow which penetrated by the side of the window, so as to cover half the picture.”

In the “Sala del Pregadi :”—

The painting by Jacopo Tintoretto, representing the Doge Leonardo Loredano imploring the protection of the Virgin Mary, was restored ; and the three paintings of Palma Giovane, in which are represented the League of Cambray, the Union of Candia to the Venetian Dominion, and the Tributes of Various Cities, “ were so much damaged that they ought to be repaired.” To these was added, the Dead Christ supported by Angels, of which we read, “ its greatest injury resulted from being washed in an improper manner, by which it was injured, and from a very great blackness which seems to be incorporated with the colour ; hence success cannot be promised.” And lower down we read, relative to the oval painting on the ceiling, painted by the same author, and to the other two by Marco Vecellio and Dolabella, that they had suffered “ from the same misfortunes.”

It would also have been desirable to restore to their former splendour six frescoes,¹ of whose existence few are now aware,

¹ Frescoes of Titian. Since this was written the whitewash has been removed from one of these frescoes, the S. Cristoforo over the door leading down to the Church of S. Nicolò. Kugler says the head is fine, the rest of the figure very mediocre. The surface of the picture is broken in a few places as if from accident, and the surface is dirty. The figures are perfect, and have never been retouched. The colours are dark like those of a

which were painted by Titian in the small church of St. Nicholas, in the same ex-ducal palace, and which, unknown to the Government, were whitewashed by the troops^s who were quartered there. The Commissioners, who still remember them, believe that they have perished from the effects of time. These paintings had been overlooked during the researches of the members of the College of Painters, who visited the public places. If no operation has yet been put in practice to recover them, some laudable efforts might now, at all events, be easily made, to remove from the walls the calcareous crust which encloses them, as was done to the celebrated Last Supper of Leonardo da Vinci, engraved by Morghen, and which, after being covered for two centuries with whitewash, was again brought to light by a traveller.

painting in oil, the red (*terra rossa*) drapery is of a good colour, but it was impossible to say whether the inner drapery had been blue or green. The sky was also a heavy dirty grey. It is rather singular that Boschini (*Ricche Minere*, p. 54, Ed. 1674) mentions the five other frescoes, painted in the Church of S. Nicolò,^a but he does not mention this S. Cristoforo. Sig. P. Edwards frequently suggested to the Government by memorials (one of which I have seen among his papers in the Academy) the propriety of removing the whitewash from these pictures, but no notice was taken of his communications. His son, the author of the MS., told me he should himself offer to remove the whitewash. Boschini notices that these pictures were injured, he says, from the effects of time, but probably the injury arose from other causes, since the frescoes painted by Titian in the Scuola of S. Antonio at Padua are still in good preservation.

² In 1798. See the Report of Edwards for the years 1805, 1810, in the Academy. I have copied this date from a marginal note by Sig. Edwards, written in a copy of Boschini's *Ricche Minere* which he lent me at Venice.

^a Boschini says, "Passing onwards a few steps, and on the left of the *Scala de' Giganti*, and the open stairs, we shall find the small Church of S. Nicolò, where Titian painted in fresco by the altar the four Evangelists, two on each side; and in the Lunette the Virgin and Child with S. Nicolò kneeling on her right hand, and the Doge Gritti on the left.

"Opposite the altar in the Lunette over the door is S. Mark sitting on the Lion, and all these pictures are, as I have said, by Titian."

The public restoration of paintings being directed by the same inspector, produced good results also under the

ITALIAN GOVERNMENT.

Few pictures were restored during this period, except those which were effected for the ornament of the vice-regal palaces of Venice and of Strà : and it will readily be supposed that these are sufficient to demonstrate the necessity of publicly teaching this art, thus diligently promoted by the above-mentioned inspector, who, besides being the guardian of the royal pictures, had been elected conservator of the Picture Gallery of the Academy.

This was also proved by the restored paintings destined for the Vice-regal Gallery of Milan, among which were many portraits of Venetian senators, some of the best of Tintoretto's, and some even by the great Titian, which, on account of their extreme blackness,¹ required to undergo a process of cleaning, at once so difficult and dangerous, that the pictures would probably have been destroyed had the task been conducted under the direction of another man.

If an opportunity be desired of studying some of the effects of the first restoration, as well as that executed in 1814, on works painted in various styles and all by classical masters, it will be found in the rooms of the Old Library and of the Procuratie Nuove. There is the Virgin by Cima [da Conegliano], another by Bellino, and the Christ of Albert Dürer, in restoring which, in the year 1779, 128 days of work were spent. Then there is the Noah's Ark, by Bassano, which, being recovered about the above-mentioned period from a foreign country, was restored to Venice in a most ruinous condition, folded in several places, and in several parts detached from the ground. Then,

¹ The cause of this darkening of the pictures of Titian and Tintoretto is ascribed in Venice to the excessive use of Asphaltum, not only on the shadows, but in glazing and harmonizing the picture. The tendency of this pigment to grow darker in time is well known.

as examples of the more recent restorations, there is the San Marco saving the Saracen from Shipwreck, the Adoration of the Magi, and the St. Joachim driven out of the Temple, with many others, the daily and private ocular inspection of which, united with assiduous lessons of art, were always entrusted to the above-mentioned Conservator of the Academy.

It must not be attributed to partiality in the writer, if he wander from his subject, in order to draw attention to the great knowledge and artistic skill which constitutes the merits of these restorations, in which it is well known that the characteristic style of the authors was not departed from, or the original beauties diminished or obscured.

But the great excellence of the most eminent works of this kind can never include an idea more perfect than that corresponding to the original condition of this or that work just as it came from the hands of its author, and for this reason, if, after this date, a picture began to show symptoms of decay, it would be unjust to pretend that when restored to its pristine youth, it should also acquire an incorruptibility, which it did not possess in its first state.

Hence, if after a long course of years some of the restored paintings should have again begun to decay, this is only a continuation and consequence of their inseparable tendencies, and not a defect of the art, the scope of which can never be to change nature, but only to give it help and succour. Then the reciprocal affinity between the most active elements of this Venetian atmosphere, and the material substance of the paintings, and more especially of oil paintings, and the various mechanical methods employed by their authors, being accurately known, more physical causes of insensible destruction are to be found than are sufficient to produce, in spite of the most skilful restorations, greater alteration in the before-mentioned pictures than we find to have occurred between the year 1779 and the present time. But excepting all these innumerable and accidental causes, the results of the public restoration of the royal pictures between 1779 and 1814, although sixty years ago,

prove, even in their present state, that they were directed with uncommon learning and great skill.

From this it is manifest, that if a superintendent be provided with sufficient knowledge, prudence, true zeal, and superior probity, the Government may at all events rest quietly in the certainty of its confidence being well placed. It is now time to see from the facts which follow, whether, from 1814 to the present day, the restorations of the royal paintings have proceeded with equal success, and whether the pictures themselves have been safely preserved.

In the year 1816, the Venetian Academy, having become possessed of 250 paintings, presented to them by the royal munificence for the decoration of the public picture gallery, raised a doubt, notwithstanding the successful experiments of sixty years since the commencement of the public restoration, whether it would be of greater utility and security to leave the above-mentioned paintings in the state in which they then were, or to repair them in the usual manner.

The votes being taken, there was not found to be a sufficient majority in favour of the definitive determination of the Government to promote an undertaking, the execution of which would have decided the fate of so valuable a portion of the public property, of the honour of the art of restoration among the Venetians, of the reputation of the Royal Academy, in the bosom of which it ought to be exercised, of the fame of the celebrated "Capi-Scuola," recommended in their works to the fidelity of their country, and, finally, of the utility which would arise to the public in the education of the rising artists.

Objects of such importance obliged them to entrust to the experience of the above-mentioned aged director of the public restorations and conservator of the picture galleries of the Academy, the commission of writing an official Report¹ on the necessity

¹ The Report here alluded to is preserved in the Academy at Venice. It is a most interesting document, but owing to circumstances which I could not control, I was prevented from taking a copy of it. I, however, procured an extract to be made from it, a translation of which will be found

and utility of the restoration of the pictures, in which might also be demonstrated the advantages that would arise from the establishment of a public school for this purpose. The practicability of the subject first suggested being abundantly proved, it was adopted in the year 1817, and the restoration was permitted, but, as will be easily believed, in the full confidence that the execution of such operations should be directed by that same conservator to whom it exclusively belonged by reason of his office.

A decree so well considered, through the care of his Excellency the Governor (Count Göess), did not limit to a certain period of time so delicate an enterprise, for accomplishing which many years and many restorers were necessary; the Government well knowing that had they acted differently, they could not have expected a result corresponding with the views which, in their provisions, they had contemplated.

The President of the Academy,¹ having given to this judicious decree an interpretation which could not possibly have been contemplated, waiving the above-mentioned considerations, and reflecting that the slow re-establishment of the health of the Conservator, who was then indisposed, was incompatible with the rapidity with which he desired to complete the splendid decorations of the room destined for the annual distribution of the prizes in August, 1817, resolved to commence immediately the restoration of those pictures which were to be used for this purpose. The exclusion of so important a surveillance was the first error of the then President; we think proper to make this remark on account of the importance of his influence.

In addition to this, the whole work was confided to two artists only, on whom the Inspector of restorations thought he could not depend unless he kept them under his daily ocular inspection, and directed their labours with assiduous artistical lessons, and the best of whom he did not consider sufficiently careful to

in p. 885, which will show Mr. Edwards's opinion as to the best method of rendering paintings in oil durable.

¹ The Conte Cicognara, author of the works on Sculpture and on Nielli.

be proposed as master of the school of pictorial restoration projected in 1816. This second oversight was not inferior to the first; indeed it was worse, inasmuch as these artists were generally reputed for various reasons to require the most rigorous and careful superintendence.

But when it is considered that the labour of the two artists above-mentioned was limited to the short space of four months, when five or six years were really necessary, and that within this time they were required to repair thirty paintings of great size,¹ both on panel and on canvas, one may easily be con-

¹ Among the pictures restored in this hasty manner was the Assumption of the Virgin by Titian, formerly in the Church of the Frari, but now in the Gallery of the Academy. I saw the contract for the restoration of this picture among the papers of Sig. Pietro Edwards. It was made between Sig. Edwards, as Director of the Restorations, and Sig. Floriani, by whom the picture was restored. It contained the following stipulations:—

“The above-mentioned restorations shall be made upon a ground of gesso, tempered with weak ‘colla di ritagl;’ and the parts to be repainted, as well as the indispensable reparation of portions of the old colour, shall be executed with varnish, the use of oil being absolutely excluded; and for this purpose Sig. Edwards shall supply eight pounds of varnish, which shall be delivered into the charge of Sig. Floriani.”

The date of this document was the 21st of February, 1816. From the bills of expenses which accompanied it, I ascertained that the varnish supplied by Edwards consisted of “acqua di ragia” and mastic; ^a that the paste used for lining the picture was composed of flour paste, Flanders glue, and ox-gall. The use of the latter ingredient was to preserve the paste from the attacks of insects.

The method of pressing freshly lined pictures pursued by Sig. Edwards differed from that practised in this country. The process was described to me by his son; it was as follows:—

The face of the picture being secured by pasting paper over it, it was laid on the polished Venetian floor, or, as it is called, “Terrazzo,” and the lining was fixed to it. Hot sand was then laid all over it, beginning always in the middle of the picture, whence the sand gradually spread to the edge, and the picture was covered to a certain height. By this means the air was pressed out from between the canvas and the picture, and an equal

^a According to Sig. Edwards, the best proportions for making this varnish are 1½ oz. of spirit of turpentine to 1 oz. of mastic.

vinced, even by merely considering the probabilities of the case, that the result would be anything but satisfactory. This was the third blunder committed while the Academy was under the guidance of this President; nor is it easy to understand how, when the effects were so evident on these precious monuments of art, and on the other objects which relate to them, even independently of their belonging to royalty, it should have been decided to employ such dangerous measures.

The result of his zeal corresponded with the anticipations of the Conservator of the Academy, and justified his respectful disapprobation. We cannot do otherwise than believe that the former President was ignorant both of his anticipations and of his disapprobation, for in the annual discourse for 1817 his activity in bringing to new life those splendid monuments of

degree of warmth and pressure was communicated at the same time to the whole surface, much more safely and effectually than with a hot iron.

The information I had obtained relative to technical processes used by Sig. Edwards in restoring the Venetian pictures, naturally induced me to examine carefully some of the paintings that had been repaired under his superintendence, and especially the "Assumption of the Virgin" above-mentioned. The general effect of this picture is fresh and beautiful in the extreme, but on looking into it, many parts are perceived which appear to have been retouched with megulp, for they exhibit the cracks to which paintings executed with this vehicle are liable. In other parts the colour is lowered, as if oil had been used, evidently showing that the painting had been repaired with more than one vehicle. The darks of the picture look as if they had been injured by the application of something corrosive. From these remarks I think it very probable that the picture has been repaired more than once since its restoration under Sig. Edwards in 1816, now 30 years ago. At the same time, I must acknowledge that Sig. O'Kelly Edwards frequently lamented the extreme haste with which the painting had been repaired, and which perhaps will account sufficiently for the numerous cracks in the new parts.

Titian's picture of the "Presentation in the Temple" is also much cracked in several parts, apparently from the effects of restorations. The same may be observed of the Miracle of St. Mark by Tintoretto.

I have been informed that Sig. Edwards used no varnish but that of mastic in restoring the decayed pictures, but this is objected to by many modern Venetian restorers of the Government pictures, some of whom use raw linseed oil only, others linseed oil boiled on litharge. It is unnecessary to comment on the effects of such restorations.

which, according to his cautious expression, he was the “passive keeper,” is highly praised.

Some of the injuries effected by the restoration of 1817 are visible to all intelligent persons, but there are others which work secretly and which are only known to a few—time will show the result of these. He who does not know the previous state of the pictures, or who is unacquainted with the nature of the painting, and the mode in which the picture was executed by its author, who cannot distinguish the intrinsic and inherent defects incident to the works themselves, from those which are the consequence of bad restorations, who possesses or trades with paintings restored in the same manner as those of which we are speaking, and lastly, who is contented with an apparent illusion, cannot be a judge in these affairs.

A written report was wanting, from which might be known the state of the paintings of the Royal Academy at the time of the above-mentioned restoration, and fifteen years previous, as well as the methods then established, which were to be observed in the practical execution, in order to form just conclusions as to the former, and to recognize, by evidence, the latter, and hence to judge of the consequent injuries suffered by the pictures. But this deficiency is supplied by the catalogues¹ of the defunct Conservator, in which is described the state of the royal paintings from 1808, at which time they were collected in the public depository of St. Antonio, where they were carefully preserved.

But even without this, how well soever the nature of the paintings may be known as we have just observed, and the various executive methods of the different styles, it is easy to distinguish, by comparing the parts of the pictures which are intact with those which are nearest to them, the defects originally inherent in the paintings, from those which were caused in them by the influence of the climate or seasons, and from the injuries arising from the want of skill or negligence of others.

¹ These catalogues are now preserved in the Academy.

It is certain that in the peculiar nature of this or that picture is to be found the intrinsic cause of its greater or less resistance depending on the nature of the material, and on the method of the work.

The use of ill-prepared and fleeting colours, the mixture of substances which act upon each other reciprocally, the want of skill in employing alone and in large masses colours which do not well receive the cementation of the oils unless they are united with other bodies, such as vitreous and sandy colours;¹ the introduction of various liquids calculated to produce changes in various degrees in the body of a painting, and to cause it to separate in laminae² of various consistence, instead of forming one single homogeneous and uniform body, and the excessive liquidity of the too-dilute colours;³ all these are defects inherent in the solid part of the paintings, proceeding from the mechanical execution, and which cannot be remedied.

To this may be added the rigidity of the friable glues, the bad choice of the preparations and grounds used by the different painters, the thinness of the coats of colour, the glazings and the *sfregazzi*,⁴ so much loved by the Venetian school, and indeed perhaps indispensable, the retouches applied by the painter to

¹ The difficulty of employing vitreous colours, such as smalt, is acknowledged by all writers on art.

² I may mention as a fact that Sig. Schiavone assured me, that in restoring pictures by Titian, he had removed eight or nine layers of colour.

³ The ill effects of employing the colours too liquid are frequently mentioned by Malvasia and Lanzi.

⁴ *Sfregazzi* or *sfregature*. By this term is meant a peculiar thin kind of glazing, which is executed by dipping the finger into the colour and drawing it once lightly and evenly along the part of the picture on which it was to be applied, such as the shade on the cheek, the limbs, &c., or wherever it is wished to lay a soft thin shadow. It is easy to understand that the layer of colour must be very thin. These *sfregazzi* are distinguished from the glazings by the manner in which they are executed, as well as their effects. The glazings which are commonly mixed with varnish may be applied either with a brush or with the hand, but instead of drawing the finger once along the part to be painted, it may be rubbed in with the whole hand. Glazings are used for laying a flat transparent tint, but *sfregazzi* for soft shadows only.

the picture when in a state too dry and hard, with a hundred other things, are all defects inherent in the pictures and which spoil them, making them appear as if injured by the climate, and preventing the perfect union of the surface and of the interior.

Hence, besides the decay of the finer parts exposed to the contact of the external air, the whole substance of the picture becomes porous, which increases the facility of ingress to the dissolving acids, and these give rise to a secret disunion of parts, and form various combinations which are afterwards manifested by change of colour, blackness, and other marks of destruction.

In addition to these, there are the intrinsic defects peculiar to painting in oil, notwithstanding the misapplied praises of many writers. The nature of the vegetable oils obtained by expression causes them to blacken in the paintings; the peculiar loss or sinking in of the half-tints, which takes place more frequently in this kind of painting than in distemper or fresco; the drying and want of cohesion in the small particles of the colours;¹ the

¹ The effects produced on pictures by their hanging for a period of 100 or 200 years on a south wall were described to me by Sig. Schiavone. He says such pictures invariably appear as if painted in distemper, from the evaporation of the thin and fluid parts of the oil. Such pictures preserve the purity of their colours, which Sig. Schiavone assured me would wash off with water. He denies that the Venetians painted any part of their pictures with water colours, and says the appearance of it is to be attributed to this cause only. He also told me that paintings which had hung on north walls never had this appearance, but always perished from damp.

Mr. Edwards also concurred in this, and in order to show the effects produced on an old picture which had always hung on a north wall, by exposure to the sun, he related to me the following account of a Capo d'Opera painted by Cima da Conegliano, for an altar-piece in a church at Venice, which was intended to be hung on a north wall :—

The picture was on wood, and in order to preserve it from damp, the wall against which it was to be placed was lined with wood, and the space between this wood and the picture was filled with charcoal. The contrivance succeeded, and the picture was preserved until recently in a perfect state; but the late Abbate required new garments for the priests, and not having ready money available, the picture was sold. The purchaser mortgaged the picture, which was deposited for safety with a restorer of pic-

rigidity of the painting, which acquires almost the transparency of talc; the coagulation of some colours, which contract into distinct, dark-coloured, and very hard globular particles, a great and invincible defect, which is known among artists by the name of *sobollimento*.

Although these liquids are very capable of being volatilized, the proportion of their elements is restored to equilibrium by the regularity of the evaporation, after which no part of them remains but the dregs (*feccie*), which are incapable of being sublimed,¹ and which are called by the chemists "inflammable earth,"² which, in the slow operation of years and in the state of commixtion in which it is found, acquires greater friability and perhaps also greater blackness than is remarked in the artificial separation by distillation,³ and instead of considering it as the

tures, who, without considering that the picture had hung ever since it was finished on a north wall, left it on the floor of a room exposed to the mid-day sun. In the mean time the old Abbate died and a new one was appointed, who, thinking the picture had been unlawfully disposed of, instituted law proceedings against the purchaser and recovered the picture. But the picture was no longer of the same value, for it was found dried up, cracked, and almost destroyed by the exposure to the sun.

¹ The oil is converted into resin by the evaporation of the watery particles.

² It is almost unnecessary to remark that this theory, founded upon Stahl's "*Theoria Chemicæ Dogmaticæ*," the doctrines of which were inculcated as the infallible code of professors of chemistry for almost a century, is now found to be incorrect.

Stahl supposed that light and heat were occasioned by the emission of a common inflammable principle, which he called Phlogiston.

³ These remarks of Mr. Gio. Edwards are evidently founded on the opinion of his father, expressed in the Report from which I have given an extract at page 885.

Mr. Edwards appears to have been well acquainted with the distillation of oils, the residue of which is a kind of resin, liquid when heated, but solid when cold; black in colour when viewed in the mass, but a transparent brown yellow when spread on a light ground. It is without any smell, and may be diluted to any extent by the volatile oil which has been distilled from it. The smell of this volatile oil is extremely pungent and unpleasant, and as oil paintings cease to smell when perfectly dry, it may fairly be presumed that all the volatile parts of the oil have evaporated (especially if the

usual residuum of all oils, it may be considered as a result similar to that mentioned in the observations of Kunckel, who, by uniting a vegetable essential oil to a highly concentrated acid, obtained from the residue after distillation a dry and shining earth (terra) which was infusible.

For if the substance of this oily cement is supposed to change so materially, in the same manner we may readily suppose the change which it induces in the various bodies to which it is united. The strong smell of oil colours is sufficient to show the effervescence of the parts of the fresh composition, and the formation of the last combinations among the different principles which disengage themselves and unite together.

Hence, the scrutinizing and experienced eye, investigating the changes of an old painting of this kind, will find, among many other things, impure concretions of sulphur,¹ which was never used, and indeed could not have been used on that part of the picture, a phenomenon obtained artificially, as Boyle and Stahl obtained it, by simple digestion of the vegetable oils with sulphuric acid.

picture has been placed in the sun and air), and that the resin alone is left. The change therefore produced in oils by drying is a *chemical* change, for different salts come over with the volatile parts in the process of distillation. These become visible when the distilled oil is cooled to a temperature of 40° Fahrenheit, when it becomes a mass of white needle-shaped crystals which again disappear on warming the distilled oil. If this distilled oil be rectified by distilling it a second time upon water, the salts are removed and the volatile oil remains limpid and clear in the coldest weather. The good effects therefore of exposing newly painted pictures to the sun and dew, by which the volatile particles and salts or rather acids are evaporated, become apparent.

In addition to the partial decomposition of the oil, and the evaporation of the volatile acids from paintings in oil which have been exposed to the sun and dew, another important chemical change is effected, and the resinous part of the oil is bleached by the action of the chemical rays of light, and by the absorption of oxygen from the air, and especially from the dew which contains much air and free oxygen.

¹ Mr. Edwards told me his father had sometimes found particles of sulphur on old paintings, and that he had more than once called his attention to the subject, and had pointed out to him the grains of sulphur, which he had picked out of the paintings.

Besides these defects naturally inherent in the painting, there is the following, namely, that in an oil painting 200 or 300 years old, no efforts of art can remove the fixed and blackened part which cannot be evaporated. Lead, copper, and mercury are also subject to almost the same alterations when they are used on the same agents:

From these facts we conclude that the changes of these bodies in some parts of the painting can frequently be revived, but this should be understood, with very great restrictions, for some tints, especially those composed of metallic green, blackened by an excess of acid, which enters into a sulphurous combination with the oil, although once restored by the use of an alkali properly diluted, do not permanently better their condition.

There are also the injuries arising from the climate, which is the most active enemy of paintings, and only in a few cases, perhaps, can they be defended from its universal and incessant action, and although climate is most important everywhere, it is especially so at Venice, for if a writer were to make a long description of the phenomena peculiar to all the different climates of the world, he would characterize that of Venice by merely indicating its singular property of corroding all paintings in a very short space of time.

Having related the different effects of the immovable causes which we have indicated, with their modifications, I would observe that they can, by a very easy comparison, be distinguished from those which are produced by bad restorations. For example, the impossibility of increasing the thickness of the coats of colour in painting, is not a fault of the art of restoration, but the continual attenuation of them with corrosive substances is so; it is not the fault of the art if that which causes them to divide into thin laminae cannot be removed, but it is a fault to introduce a menstruum which disjoins the parts still more; it is not a fault if the unequal porosity of the mass of colour in a painting cannot be reduced to the consistence of a body fused all at one time, but the want of skill consists in rendering its surface even by rasping and by stippling it. So it is not to be

imputed to ignorance if the volatile and light nature of the *mezze tinte* are not changed into solid and resisting substances, but it shows great ignorance to increase and make them heavy with that kind of re-painting called "di corpo," nor is it an artistical error if the heterogeneous and improper ingredients which enter into the composition of the different mixtures cannot be separated from the other substances, but it is very wrong to use those things which decompose them.

In order to verify the accuracy of these observations on the visible injuries of which we are speaking, we think it sufficient to refer to the concordant testimony of the academic body to whom the anterior state of the chosen pictures, and the mode followed in their restoration, is well known.

EXTRACTS

FROM

A DISSERTATION READ BY SIG. PIETRO EDWARDS
IN THE ACADEMY OF FINE ARTS AT VENICE
ON THE PROPRIETY OF RESTORING
THE PUBLIC PICTURES.

DATED MARCH, 1812.

Of gesso and oil grounds.—The practice of painting in distemper having almost entirely ceased towards the end of the fifteenth century, another century, at least, elapsed before there was any necessity for the frequent reparation of paintings in oil. After this period the use of gesso grounds being abandoned, with great injury to the Venetian colouring, the practice of employing grounds prepared with oil was introduced, which led to the adoption of different methods of painting.

Of the art of restoring pictures.—At this time the experience derived from previous trials must necessarily have been wanting, and no experiment could be said to have been properly tried until it had stood the test of a long course of years. Meanwhile each artist adopted the method which to him seemed best, or followed, without examination, the custom which then prevailed, until the year 1730 or 1740, when, warned by the many past errors and few fortunate results, some artists adopted a better method. This reform gradually progressed, so that we can maintain on the base of indisputable facts, proved by the testimony of more than sixty years, that the art is now carried to a point of the highest utility, and has become so much the more valuable and important inasmuch as the necessity of our having recourse to its aid is daily augmenting.

Nor is any discredit thrown on the art by general accusations

founded on the unsuccessful result of its undertakings, when they are considered collectively without distinction of times, and when all the dates of so dubious a career are put together from its first beginning. The commencement of all the arts was feeble and insignificant, and even at the height of their renown they always numbered among their professors some obtuse or bad workmen. Hence, if it is wished to insinuate that the restoration of paintings should be absolutely forbidden, on the pretence that it is generally productive of the worst effects, it is necessary to show, previously to such a conclusion, that all the testimony that has been, or that can be, adduced in favour of good restorations, by means of which many valuable works of art, now admired, and formerly considered useless or entirely lost, were recovered, is evidently false or dictated by a foolish anticipation; it is also necessary to prove that the opinions of the most expert professors on pictures valued at 20 or 30 before their restoration, and actually sold for 100 or 1000 after it, were absurd, or that they were all purchased by bribery; and, finally, it must be proved that, in this general condemnation, the whole course or state of the art must be comprehended, so that from its commencement until the present time, neither work nor workman can be pointed out deserving of praise.

But if all this cannot be demonstrated, the lamentable belief of this universal falling off should be partially removed, because, while it does not correspond with historical truth, it drives to despair all those amateurs and artists who wish that by systematic laws the chefs-d'œuvre of ancient pencils may in a few years afford us no occupation but that of weeping over their legally consummated misfortunes. I well know that all this is not sufficient to change the firm opinions of my opponents who, though they cannot contradict my statements, still believe that they derive a strong argument against the restoration from some essential defects inseparable from it, and on which I ought not even to touch, lest I should increase the tedium of this long discourse; yet, that my silence may not be attributed to

an endeavour to avoid answering this objection which is reputed to be the Achilles of its party, and so give rise to suspicion against my cause, let me entreat you to suffer me to allude briefly to the alteration of tints by retouchings "di corpo" in ancient pictures, of which so much has been said.

My adversaries being persuaded that so gigantic an objection must be insuperable, inquire, almost smilingly, *What colour now used will be the same hereafter?* To this I have a most decided and short answer. That colour whose liquid cement shall be quickly absorbed by the ground on which it is placed, and which shall be afterwards covered with an appropriate varnish, by which it is preserved from immediate contact with the air, *that* will be the colour which, being used to-day, will remain permanently the same for more than a century. The assertion that all colours in all cases must change is gratuitously put forward without the slightest evidence. I might therefore dispense with adducing proofs of the correctness of my answer, were it not that the respect due to the honourable assembly which hears me obliges me to say something on the subject, with a proper regard to the greatness of your knowledge before which alone I am permitted to justify my expressions, merely observing, that from the chemical doctrines of the fermentation of the mixtures into which fluid components enter, results the cause of the intrinsic or internal alteration of the colours; that from the same doctrines of the action of the inflammable gases and carbon which float about in the atmospheric air as well as from the aqueous vapours of the same atmosphere, are derived what may be called the extrinsic change in the same colours when thoroughly consolidated; that from the knowledge, also derived from chemical science, of the attractions or affinities of aggregation alone, is demonstrated the power possessed by certain absorbent earths, such as our gesso after calcination, of attracting to themselves the oils as well expressed as essential, not miscible with water; that the most subtle and fluid portion of these substances being absorbed, and the cause of fermentation being thus removed, the most viscous and resinous parts

which remain, withdraw into themselves and condense the particles of the mixture into more strict cohesion, which thus acquires a uniform consistence most proper for preventing the penetration of the dissolving principles contained in the external air ; that the interposition of a varnish between the painting and this external air, as it prevents their immediate contact, so it preserves the surface of the colours derived from metallic oxides, which by their affinity for the before-mentioned inflammable gases might be deprived of their oxygen and be revived ; that the foundation of these theories may be seen expressed in the old chemical terms in the works of the celebrated Bergman, of Boumé, and of Macquer ; and in the formulæ of modern chemistry, which we have used, in the works of Fourcroy and other moderns, not omitting, with respect to the article of varnishes, the useful practical treatise of Watin, praised by the before-mentioned Macquer, besides all those passages in the works of various respectable authors which in a purely physical sense may be compared with them ; that, finally, the truth of my proposition is proved by the incontrovertible, though rarely occurring, fact of ancient pictures painted in oil with very few repaintings on grounds of gesso not hardened, (mark well,) not hardened by strong glue, or on canvas having a thin coating of gesso, whose colours have been preserved with as much freshness as if just painted. Such are the three paintings representing the legend of Sta. Cristina, and another, the subject of which is the Annunciation, all of which are the works of Paolo [Veronese], now existing in our Royal Academy, and already prepared in the "Gran Sala" for any observations you may wish to make on them, which being considered solely with reference to the colours not being obscured by any intrinsic change, would be judged to have been painted but two days instead of upwards of two centuries, yet not having been defended by varnish they have suffered great injuries in the parts most deficient in solid colour, being consumed by repeated rubbings or indiscreet applications on pictures remarkably rigid and dry, as well as by the continual, though imperceptible action of the

surrounding atmosphere ; so also in those small portions which present a surface of metallic colour to the contact of the air, such as the copper greens and a certain mineral blue which is no longer used, they have manifestly suffered in a small degree from the activity of the inflammable principles, according as the substance adapted to feel their action was combined in a greater or less degree with other ingredients, agreeable to the practice of Paolo, who, differing from other Venetian masters, scarcely ever used the above-mentioned colours unless mixed with others.

You will perceive, learned academicians, that I omit adding a hundred other things on this special proposition, as I ought to do in every other division of my discourse, because each by itself would have required a particular treatise ; but your penetration will certainly understand, even from what I have hitherto stated concerning the apprehended alteration of colours in the retouchings “*di corpo*,” that it was not the impossibility of making the colours of the restored parts remain always the same, that occasioned their change, which in part originated in the then unknown bad effect of stuccoes and grounds incapable of absorbing the more fluid part of the recent painting, and, consequently, of permitting it to dry ; it was the want of an universal knowledge of the theories necessary for the secure practice of the art, and these effects were sometimes produced by the desire of increasing the prospect of gain by hastening the work, aided by the stuccoes being either naturally unabsorbent or being saturated with oil previous to the retouching, or being formed of the colour itself, distempered with what ought afterwards to serve for the retouches themselves, all these being common errors on such a subject.

ADDITIONAL NOTES AND CORRECTIONS.

Note, p. clxxv.

The Bolognese MS. (p. 454) contains a recipe, which I had overlooked, in the later handwriting, for making lake from "lac overo grana." Lake made from kermes was known, therefore, in the fifteenth century, and previous to the time of Neri.

P. clxxxviii.

I am informed by a friend that the Germans consider the terms Morellen Salz, Eisen Oxyd, and Caput Mortuum as synonymous.

P. cclxi.

By the earliest varnish used in Italy, I mean to say, that which was in general use after the revival of the arts.

Note, p. ccxcv.

Since this Introduction was written, it has been pointed out to me by a friend, on whose judgment I have perfect reliance, that Paolo Pino was alluding, in the passage I have quoted, to the *drawing*, which the old masters were accustomed to finish with great accuracy, and not to the commencement of the *picture* in chiaroscuro. On a closer examination of the passage in Paolo Pino's Dialogue, I am satisfied my friend is right. I must, however, observe, that although there may be no documentary evidence that Gian Bellino began his pictures in chiaroscuro, we have still the testimony of an eminent Venetian artist that this was his usual practice. See p. cxxxiii.

Page 50, No. 11.

Several kinds of ley are mentioned in these MSS. Common ley was made by an infusion or decoction of the ashes of burnt wood in water. This was called *Ranno* in Tuscany, *Liscia* in other parts of Italy. It was also called *Colato*¹ and *Bucato*, which is the ley used by laundresses. Strong ley was called *Liscia fortissima*, weak ley *Liscia dolce*. *Capitello* was by some persons considered the same as *Liscia*; but D. Alessio says that *Capitello* was made of strong ashes and of soda with quicklime, like that of which soap is made. It was then *caustic ley*. *Ranno da Mezzo* is the same as *Capitello*,² and *Ranno da Capo*³ is probably the same. The strength of the ley was determined during the middle ages in the same manner as it is now—namely, by laying a fresh egg upon it: if the egg sank, the ley was

¹ D. Alessio.

² Alberto's Dict.

³ Bol. MS., p. 354.

too weak; if it swam, it was of the proper strength. See Bol. MS., p. 498.

Page 70, No. 48.

Tutia, Tuzia, or Tuchia, is an impure oxide of zinc found in the chimneys of the furnaces in which zinc ores are roasted, or in which zinciferous lead-ores are smelted. (Note by the Translators of Beckmann's Inventions, Art. Zinc.) Alexandrine Tuzia was prepared artificially by placing in the furnaces where the ore was smelted rods of iron, to which the zinc, being sublimed by the heat, adhered. (See Ricettario Fiorentino.) Oxide of zinc was called by the Romans Pompholyx and Bulla, Pompholige by the Italians, Tuzia by the Arabs; at a later period it has been known by the names of Lana philosophica, nil album, flowers of zinc, &c. Matthioli (Diosc., lib. v., cc. 43, 44, 45) distinguishes between the real Tutia, which he calls Cadmia Minerale, and Alexandrine Tutia. Depping (Hist. du Commerce, &c., vol. i. p. 144) says—"La tuthie, poudre de l'arbre *Goan*, que les Egyptiens tiraient d'Alexandrie; Pegoletti la nomme *ispodio*, d'après le mot *spodos*, que donnaient à cette drogue les Grecs et les Arabes." In this he is not correct. Tutia and Spodio are not to be confounded. The difference between them is pointed out by Matthioli, who, quoting Galen, says—"By *pompholige* was understood the more subtle part which rose to the top of the furnace; and by *spodio* the grosser particles which fell to the bottom." The same author mentions an artificial kind of spodio which was stated by Avicenna to be prepared from different vegetables, chiefly from canes, and it is this artificial kind of spodio which Depping has confounded with Tutia. See Matthioli's Diosc., lib. v. cap. 45.

P. 86, note 5.

The "lot" is not a liquid measure, but a weight. See the 'Note on the Weights and Measures,' p. 898.

Note, p. 112.

The proof that S. Audemar was a Frenchman and an ecclesiastic is to be found in No. 165 (p. 131), where he says, "in hac nostra patria Galliæ ut in tota Francia crescit," and "quedam herba. . . . cujus flores nos crocum laici vero safran vocant."

P. 178.

Since writing the passage in the text I have had reason to think that the glass described in the page referred to may have been black, and not blue, but as yet I have no proof of this fact.

P. 205, No. 232.

Cuprum ustum or *Æs ustum*, called also Ferretta di Spagna, was, according to Cesalpino (De Metallicis, lib. iii. c. 5), nothing but calcined copper. In modern chemistry it is denominated the protoxide of copper. The terms Ferret and Ferretta di Spagna were also applied to the native red ore of iron, called Hæmatite. See Art of Fresco-painting, p. xxxii.

P. 209.

Copper was at first called *æs cyprium*: but in course of time *cyprium* only; from which was at length formed *cuprum*. See Beckmann's Inventions, tit. Zinc.

Page 211, No. V.

Admovitrius.—This should be *ammonitrum* or *hammonitrum*, the ancient term for the "frit" or first mixture obtained by the fusion of the sand and alkali. See Pliny, lib. xxxvi. cap. 26. Cesalpino speaks positively on this point: he says that "of sand and nitre is made a mass which Pliny calls *hammonitrum*, and which is now called 'fritte.'" See Merret's Notes to Neri's *Arte Vetraria*, cap. viii.

Page 227, No. XXII.

Paramentum.—The saline efflorescence which is found on old walls. It is more acrid than common salt. Merret says that he had a specimen in his cabinet which was transparent, and very similar to alum. It is more acrid to the taste than sea-salt. See Merret's Notes to Neri's *Arte Vetraria*, cap. vii.

Page 244, No. L.

ALUMEN.—The name formerly given to all salts which had sulphuric acid for a base. In medieval MSS. these salts are also called "Glassa," or "Glace." It appears that the Romans gave this name to sulphate of iron. "The difference, that the vitriols are combinations of sulphuric acid with a metallic oxide, either that of iron, copper, or zinc, and alum on the other hand with a peculiar white earth, called on this account alumina, has been established only in modern times."¹

Many kinds of alumen are mentioned in medieval MSS. A pigment of this name, which appears to have been *Allume Scagliuolo*, is twice alluded to in the third book of Eraclius. See pp. 245 and 232.

Alumen glacie, *Alumen glarum*, *Alun de glace*, *Alumen jameni*.—There is little doubt that these were merely different names for Roche Alum.² *Allume di feccia*—Tartar of wine dried in the sun during the dog-days.³ Carbonate of potash. *Allume catino*—Carbonate of soda. *Allume di piume*, *Alun de plume*—called also *Allume Scissile*. It is a natural alum, composed of many threads, which are white, straight, fine, and shining like crystal, which form here and there certain fringes or beards like feathers. It is frequently confounded with the stone called *Amyanthus*, or *Fiore di pietra*.⁴ *Allume di Rocca*, *Roche Alum*, *Alun de Roche*—The best kinds of alum are known by this name. The genuine is of a pale red colour; but this is frequently imitated by colouring the common kinds of alum. The origin of the term

¹ Beckmann, Inventions, tit. *Alum*.

² See MS. of Le Begue, Nos. 42, 93, 299, and Table of Synonymes; and the Bol. MS., No. 3.

³ Ricettario Fiorentino.

⁴ Alb., Diz. Enc.; and see Ricett. Fior.

Roche alum is doubtful. Beckmann thinks, with Leibnitz, that the name was derived from Rocca, in Syria. *Allume Scagliuolo*—A kind of stone resembling talc, of which, when calcined, is made the "gesso da oro," or gesso of the gilders, and which is also used for the grounds of pictures. The heat renders it opaque like gesso, and causes it to split into layers.¹ It has been observed (p. cliii.) that this was probably the pigment called *Alumen* by Eraclius. *Allume Zuccarino*—Roche alum pounded with sugar, white of egg, and rose water.²

Page 258, note.

In a dissertation, published at Vicenza in 1845, entitled 'La Carta,' Sig. Giuseppe Riva, author of several archæological works, endeavours to prove that the manufacture of paper was known to the Romans, and described by Pliny; and in the Appendix to the Second Edition of this Treatise, published in the following year, Sig. Riva mentions two medieval documents which are among the earliest known to be written on paper. They are preserved in glass cases in the Archivio Capitolare at Verona. The first, which is of the ninth century and of the reign of Charlemagne, was signed by Bishop Ratoldo in the year 814, as appears in the *Italia Sacra* of Ughelli (2nd edit., tom. v. pp. 707, 708). The other is about a century earlier, and was subscribed by Diodato, son of the Doge Orso. (See Maffei, *Verona Illustrata*, iii. p. 1, p. 298, and *Apol. Rifl.*, p. 25 and 27.) Both documents, which were examined by Sig. Riva and other antiquaries, were found to be on paper similar to what is now in use, and in excellent preservation; but it could not be ascertained whether the paper was made of linen or cotton.

P. 303, No. 322.

Since this work was printed, I have been favoured with another copy of this recipe which appears to be more correct than my version; I therefore subjoin the variations:—

Pour or mouler recipe. R. tres fin or lime bien menu, &c. Mais avant ce doit estre bien limanze d'or bien lave en un bacin ou une conche de limee en [a] un pincel et a ce mortier dessus dit molez tant or que l'eaue qui y sera mise soit au departir clere. Et en telle maniere pourrez molir cuivre, argent estaing ou tout autre metal mais gardez que lor ne se paerde car il faudroit remoudre de rechief, &c.

A recipe for grinding gold. Take some very fine gold filings, &c. but your filings should be previously well washed in a basin or shell with a pencil. Then grind all your gold in the above-mentioned mortar, until the water passes off clear. And in this way you may grind copper, silver, tin, and all other metals, but take care that the gold is not lost, for it would then be necessary to re grind it, &c.

Page 313, No. 341.

The word "glas" occurs frequently in medieval MSS. It is sometimes

¹ Alb., Diz. Enc.; Ricett. Fior.; Matthioli, p. 1430.

² Ricett. Fior.

written "glasse" or "glasse aromatique," and sometimes it is joined with alum; for instance, "alun de glace," "alumen glacie," "alumen jameni vel glasso." The term has many significations. It was applied during the middle ages to alum; the name being probably given from the resemblance of the crystallised salts to glass, in the same manner as the sulphates of iron, copper, and zinc were called "Vitriols" from their glassy appearance. (See Agricola, De Metallicis.) In Welsh, Armoric, and Irish, the herb woad, which was used as an alkali in glass-blowing, was denominated "glas" (glastum or vitrum): the same term was also applied by these people to the colours blue and green. (See Edinburgh Review for July, 1847, p. 201, n.) The Romans gave the name of glessum to amber, which was called by the Germans "glas." The latter term was also applied to Sandarac, the principal ingredient in the Italian "Vernice liquida," and this has occasioned much confusion.

The following passage from Mr. Eastlake's 'Materials' (p. 246) will serve as a guide in determining the meaning of "glas" when used with reference to varnishes:—"Where both terms [vernix and glas] appear together, they mean distinct things, and the text can alone show which of the two meanings each conveys; but in general *glas* means amber, and *vernix* sandarac." With this view of the subject, therefore, the word "vernix" in No. 207 of the MS. of S. Audemar (p. 163) means sandarac, and "glasse" in the following recipe amber: the same may be observed of the passage in No. 274 of the Paris copy of Eraclius, "si autem *vernix* non habueris, accipies *glas-sam*." But with respect to the term "glasse aromatique" in the Le Begue MS., p. 341, there is no positive evidence which ingredient is meant.

As late as the year 1617 the word "glasse" was synonymous with the English word varnish. See Minshew's 'Guide unto Tongues,' London, 1617.

There is yet another signification of the word "glace" which has become obsolete, namely, "glace d'étain," the old name for bismuth.

P. 327.

"La Cornoaille fournissait au commerce du moyen-âge son étain. On l'envoyaient brut dans l'île de Majorque, en Provence, et à Venise, pour le foudre. Celui qu'on avait apprêté à Venise était le plus estimé dans le Levant."—Balducci Pegoletti, *Prattica della Mercatura*, cap. xxix., quoted by Depping, *Histoire du Commerce*.

P. 384.

This observation refers to the second kind of Giallolino, which is described in p. clviii.

P. 606, last line but 4.

This passage has been inserted by mistake—powdered glass is not, I believe, mentioned in the Marciana MS.

P. 636, line 16.

Instead of the present translation, read thus—

When making the varnish, you must boil and skim it well, if necessary, that it may be clear and thick.

P. 649, note 5.

It may be necessary to remark that the name "Biadetto" was given both to the native and the artificial blue carbonate of copper. See p. ccii.

P. 822, note.

The reference to the 'Traité de Mignature de Cristophe Ballard' is incorrect. The method described in this work of applying the blue pigment differs from that in the text. See p. ccviii.

NOTE

ON THE WEIGHTS AND MEASURES WHICH OCCUR IN THIS WORK.

The weights and measures mentioned in the different MSS. vary so much that it may be necessary to give a short account of them.

Those which occur in the French MSS. are the following—namely, the pound, the quarteron, the ounce, the denier, the blanc, and the esterlin: the last was, properly speaking, an English weight.

The pound varied in different parts of France. At Paris it contained 16 oz.; at Lyons 14; at Toulouse and in Provence $13\frac{1}{2}$ oz.; and at Rouen $16\frac{1}{2}$ oz. and $\frac{1}{4}$ ths of the Paris weight. The weights mentioned by Le Begue were those used at Paris; and those in the recipes brought from England, which have French names, were probably the same as were then used in the Anglo-French provinces.

The Paris pound, used to weigh gold, silver, and the richer commodities, was thus sub-divided—

24 grains	=	1 pennyweight or denier.
3 deniers	=	1 gros.
8 gros	=	1 ounce.
8 ounces	=	1 marc = 2 quarterons.
2 marcs	=	1 pound = 7560 grains Troy.

The grain was sub-divided by the moneyers in the following manner—

1 grain	=	20 mites.
1 mite	=	24 droits.
1 droit	=	20 periets.
1 periet	=	24 blancs. ¹

The Esterlin was a goldsmith's weight, equal to $18\frac{1}{4}$ grains.² It was introduced into England by the Anglo-Saxons, who were called Easterlings or

¹ See p. 86, No. 94.

² See p. 88.

Esterlings, whence the name of the coin. From this it is easy to perceive the derivation of the term "sterling" now applied to English money generally.

The English weights have their first composition from the silver penny, which ought to weigh 32 wheat corns taken from the middle of the ear (some authors add, which should be well dried). The silver denarius was, in its diminished state, the pattern of the English and Gothic penny; and as the denarius gave name to the weight used on the Continent, the penny gave its name to our pennyweight. The weight of the penny, from the Conquest to the 28th Edward I., was originally 24 grs.,¹ but in the reign of Edward III.² it fell to 18.³ This, it will be observed, was only half a grain less than the goldsmith's weight called Esterlin, and it is extremely probable that this Esterlin was of the same weight as those Anglo-Gallic pence coined in the reign of Edward III., by himself and his son the Black Prince, which were actually denominated "Sterlings" and "Aquitaine Sterlings."⁴ Twenty pence (of the weight of 32 wheat corns) made an ounce, and 12 ounces 1 pound. This was Troy weight, called by Fleta "Trone weight."⁵ It was used to weigh gold, silver, precious stones, medicinal preparations, and bread. The quantities then, in the recipes given by Theodore of Flanders to Le Begue, must be calculated by Troy weight, and not by the Paris weight.

Italian weights and measures are mentioned in those parts of the Le Begue MS. which were translated from the Italian.

The Italian pound was divided as follows—

G 24 grains = 1 Scropolo (scruple) or danaro, the French denier and English pennyweight.

ð 3 scruples = 1 dragma (drachm).

ʒ 8 drachms = 1 ounce.

ʒ 12 ounces = 1 pound, equal to 12 oz. of the Imperial pound avoirdupois, or to $\frac{1}{4}$ ths of that standard.

The Venetian ounce contained 9 drachms. The modern Roman pound was equal to 1 marc $\frac{1}{2}$ gros 14 grs. French.

At Genoa and Venice goods were weighed either by the *peso grosso* or the *peso sottile*. The latter was used for weighing gold, silver, and valuable articles; the former for other things.

100 pounds of the *peso sottile* of Venice were equal to 61 $\frac{1}{4}$ ths commercial pounds of Amsterdam.

100 pounds of the *peso grosso* = 94 $\frac{1}{4}$ ths of the same pounds.

The following table will show the relative proportion of the several weights used in the countries mentioned in the MSS.—

¹ Redding, *Annals*, vol. i. p. 388.

² *Enc. Brit.*, tit. *Medals*.

³ Edward III. died in 1377, only five years before the earliest date mentioned by Alcherius.

⁴ See Akerman's *Numismatic Manual*, p. 377, 379, and 383.

⁵ Some authors derive the name of Troy weight from *Troy Novant*, the monkish name for Loudon, the former capital of the Trinobantes, as the inhabitants of Middlesex and Essex are called by Cæsar (B. G. 5, 20).

	lbs.	oz.	
100 pounds of England are equal to	91	8	of Amsterdam, Paris, &c.
	137	4	of Genoa.
	132	11	of Leghorn.
	153	11	of Milan.
	152		of Venice. ¹

A Rotolo is a Venetian weight of 32 oz. : also a Sicilian weight of 2½ lbs.

The "loth" mentioned in Nos. 96 and 97 (p. 86), and still used in Germany, Denmark, and other parts of the north of Europe, was probably introduced into England by the Anglo-Saxons. It is equivalent to half an ounce. The German pound is divided in the following manner :—

4 drachms	=	1 loth.
2 loths	=	1 ounce.
8 ounces	=	1 marc.
2 marcs	=	1 livre or pound.

In No. 97 "creeres de Inde" are mentioned. The term "creeres" may have been a corruption of "seer," the common Indian pound, which is equal to 12 Paris ounces.

MEASURES.

In the MS. of Le Begue the pint, the quart, and the chopine are mentioned. Their relative value was as follows :—

The old Paris quart was equal to 2 pints.		
1 pint	„	2 chopines.
1 chopine	„	2 demi setiers.

The Paris pint was nearly equivalent to the English wine quart. These measures are mentioned in the recipes given by Theodore of Flanders to Alcherius.

ROMAN LIQUID MEASURES.

		Eng. wine gallon.
4 cartocci	= 1 <i>Foglietta</i> , equal to	0·0868
4 fogliette	= 1 <i>Boccale</i> „	0·3471
32 boccali	= 1 Barrile „	11·1072

TURIN LIQUID MEASURES.

2 <i>Boccali</i>	= 1 <i>pinta</i> , equal to	0· $\frac{1}{13}$ ths
6 <i>pinte</i>	= 1 Rubbo „	2· $\frac{1}{4}$

FLORENTINE LIQUID MEASURES.

2 <i>quattrini</i>	= 1 Mezzetta or metadella	0·13125
2 <i>mezzette</i>	= 1 boccale	0·2625
2 <i>boccali</i>	= 1 fiasco	0·525
20 <i>faschi</i>	= 1 barrile	10·5
10 <i>barrili</i>	= 1 congo	105

The words in Italics occur in the Italian MSS. ; and in those parts of the Le Begue MS. which were translated from the Italian.

¹ From the Enc. Brit., art. *Weights*.

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