

**MAARTJE STOLS-WITLOX**University of Amsterdam  
Amsterdam, The Netherlands  
m.j.n.stols-witlox@uva.nl**HISTORICAL  
RESTORATION RECIPES:  
THE CLEANING OF OIL  
PAINTINGS 1600–1900****Keywords:** conservation history, cleaning, varnish removal, varnishing, recipe**ABSTRACT**

Knowledge about historical cleaning methods and materials is important since remnants may still be present within the paint structure and should be taken into account when interpreting instrumental text analyses and deciding about future conservation treatments. This paper provides analyses of historical recipes for surface cleaning, varnish removal and subsequent varnishing of oil paintings.

**RÉSUMÉ**

La connaissance des méthodes et des matériaux historiques de nettoyage est essentielle, dans la mesure où des traces peuvent subsister dans la structure de la peinture. Celles-ci doivent être prises en compte lors de l'interprétation des analyses de texte instrumentales et de la prise de décisions au sujet des futurs traitements de conservation-restauration. Cet article livre les analyses de recettes historiques de nettoyage en surface, d'élimination du vernis et de revernissage des peintures à l'huile.

**RESUMEN**

Los conocimientos sobre métodos y materiales de limpieza históricos son importantes, ya que todavía pueden quedar residuos dentro de la estructura de la pintura, y esto debería ser tenido en cuenta a la hora de interpretar los análisis de texto instrumentales y decidir futuros tratamientos de conservación. Este artículo proporciona un análisis de recetas históricas para la limpieza de superficies, la eliminación de barnices y el posterior barnizado de pinturas al óleo.

**INTRODUCTION**

The relevance of conservation history for our profession has been proven by publications dealing with the evolution of the profession and with the lives, activities and ethical considerations of specific restorers. Restoration recipes have often played a role illustrating day-to-day practice. However, no recent publication has elevated practical instructions to its main theme and provided a systematic overview. This is unfortunate, since historical instructions for the restoration of oil paintings may prove vital for the interpretation of scientific analyses. Moreover, because (residues of) restoration materials are still present within the paint structure, knowledge of past restoration treatments may influence conservation decisions nowadays. This paper focuses on historical recipes for the cleaning of oil paintings, by which is meant the removal of surface dirt, varnish and non-original paint, and subsequent varnishing.

**METHODOLOGY**

Practical instructions for the restoration of oil paintings were gathered from published and unpublished sources, with an emphasis on West European sources published between 1600 and 1900.

Specialised publications and general household recipe books were both included in the research. Although written for different audiences, they are equally relevant to answer the question: 'Which materials and techniques were advised for the restoration of paintings?' The fact that not all historical restoration recipes were composed by experts was already commented upon by Montabert in 1829:

(...) it is very singular that people who are strangers to painting dare publish and advertise recipes to clean paintings. Books of secrets are full of such methods, sooner aimed at destroying the colours than at reviving them. (Montabert 1829, 712–713).

**CLEANING AND VARNISHING**

Historical recipes demonstrate that the removal of surface dirt or varnish was often performed by owners themselves. In contrast to retouching or removing oil varnishes, these treatments were presented as periodical maintenance which could be 'executed by everyone'. During the 19th

century, authors emphasized the pleasure owners would gain seeing their paintings unveiled ‘by their own hands’ (De Burtin 1846, 251–254). Some blamed the lack of skilled restorers, which forced owners to either carry out restorations themselves, or trust their paintings to less well-meaning professionals, who hid the damage they caused below overpaint and varnish (Montabert 1829, 693).

Today’s emphasis on step-by-step removal of unwanted surface layers was not present in pre-19th century recipes. Although early authors described different types of dirt, they did not attack each layer separately but advised a single cleaning to deal with all problems. This approach was at least partially caused by the fact that many early cleaning methods were rather unspecific.

Courtin’s comment, ‘the state of the painting should determine the choice between procedures’, was a first sign of a more methodical approach (Courtin 1830). Almost simultaneously, Montabert (1829) stated that the skill of restorers rested in their ability to recognise each material and in their knowledge about its removal. Thus, the material composition of paintings, type of dirt, varnish or overpaint determined suitable cleaning methods.

Montabert and contemporaries advised to first attempt dry cleaning or use pure water before proceeding to solvents or alkalis. If still no satisfactory result was achieved, they would increase concentration or polarity, add abrasives, lengthen exposure time or they would combine materials (adding solvents to lyes or vice-versa). If all else failed, knives or scrapers were advised.

In the early 19th century, authors introduced the topic of varied solvent sensitivity in different areas. Although Montabert (1829) explained that partial cleaning resulted in the destruction of tonal balance, others warned that shadows required a more careful treatment (Vergnaud 1831).

### **Dry cleaning methods**

Dry cleaning tools included brushes and cloths for overall cleaning or knives to scrape off smaller dirt deposits, grease and overpaint. A shocking cleaning recipe by De Piles (1767), repeated by a number of authors, advised rubbing (iron) filings in a handkerchief over the surface. Toothpicks were considered useful to remove remains of old varnish from the crevices of the paint layer (Courtin 1830). Hampel (1846) warned that dirt remnants could be ‘glued’ to the surface by a newly applied varnish. He stated that every slack canvas should be relined to enable dirt removal, since relining would flatten the canvas and result in a stiffer surface, which would be easier to clean.

Dry removal of resin varnishes by powdering with fingers dipped in varnish or resin powder remained popular throughout the period. Powder was wiped off with a soft cloth. De Burtin (1846) explained that powdering was only suitable for small paintings with smooth surfaces. Vergnaud (1831) advised to wash varnishes with brandy to make them brittle before removal by rubbing. If rubbing produced balls instead of white powder, this was considered a sign of overpaint. If the powder looked dirty, egg white was present (Lucanus 1828). Horsin-Déon (1851) wrote that egg white or

glue below a varnish should be left undisturbed whilst rubbing, to protect against abrasion. Afterwards, it could be removed with water.

### Saliva or water cleaning

De Burtin (1846) expressed his regret that saliva cleaning was unpractical for large paintings. But, he added, it is an excellent material to test the effect of cleaning.

Hot or cold water, applied with a sponge, chamois leather or cloth, was considered harmless by many. The surface was dried with a cloth afterwards. One particular recipe, which appeared in many sources, advised applying a clean wet cloth to the painted surface. It was kept moist, renewed when dirty and left in place for as long as two weeks, ‘till it has entirely drawn out all the filthiness from the picture’ (Hubbard 1775).

Several authors did recognise the dangers of water and warned for canvas shrinkage and the fact that water could dissolve the paint or chalk ground. To prevent water from entering the paint structure, Courtin (1830) advised saturating paintings with drying oil (poppy, nut, linseed or walnut) before employing aqueous methods.

### Soaps, alkalis and acids

To increase the effectiveness of water, lye or soaps were used. The fact that soaps – like Genoa soap, black or brown soap – were quite aggressive is clear from many warnings that long exposure resulted in colour loss. Several authors showed an awareness that also lye could ‘loosen the colour’ if not used carefully (Anonymous 1777, 184).

Lye was obtained by boiling the ashes of oak, weld, vines and potash, mixed with water. It was filtered and diluted with water depending on its use. Both soaps and lye were applied cold or tepid. They were usually massaged into the surface with brushes, sponges or cloths. The surface was rinsed with water and dried. Horsin-Déon (1831) advised cleaning from the top down, because old varnishes would protect paintings from water, applied to rinse away alkalis, which ran down the surface. Tiquet (1741) mentioned pouring water onto the surface *during* treatment to check whether the painting was clean.

Horsin-Déon (1851) prescribed oil application between repeated soap washing to soften and detach dirt. Smith (1676, 74–76) advised applying wood ashes mixed with water ‘rather thickly’ and rinsing with water. His recipe came with a warning:

But note, that this scouring ought not to be practised but very seldom (as, when your picture is very much soiled) because often and too frequent operations of this kind, must needs wear off a little of the colours; therefore strive what you can to preserve their first beauty, by keeping them free from smok, and by often striking off the dust with a fox-tail.

For cleaning unvarnished paintings, De Burtin (1846) advised using soap-maker's lye (caustic soda), which he considered very gentle. It was added drop-wise to water until it felt slightly glutinous between the fingers. The lye was rubbed into froth on the surface with a brush and immediately removed with a large sponge. He advised not to increase the concentration, but to soak the surface with oil or water to soften the dirt or to add quartz sand. Additions of smalt or quartz sand to both aqueous and solvent-based methods were mentioned regularly and seem to have been standard procedure.

Some recipes specified direct application of wood ashes. Although most authors advised thorough rinsing after using lye, recipes provide evidence that lye was not always removed: an anonymous source (1854) advised passing oil over the surface straight after applying a lye.

Also fresh and stale urine were mentioned. Sometimes they were added to lye; one recipe prescribed alum and salt dissolved in warm urine (De Piles 1767). Combinations of wood ashes, soaps, urine, sometimes even solvents or drying oils were commonly advised. Hubbard's 'secret to render old pictures as fine as new' involved boiling an old lye with Genoa soap and wine spirit. It was strained through a cloth and applied (cool) to the painting twice.

Other alkalis or acids mentioned were 'eau seconde' (boiled potash and burnt wine lees) for grease removal, 'eau forte' (nitric acid in water) for resistant varnishes, lemon juice for cleaning copal containing paints, vinegar to remove egg white varnishes, and diluted sulphuric acid for the removal of oil layers (Hampel 1646, De Piles 1767, Vergnaud 1831, Thomson 1839).

### Solvents

Recipes frequently recommended solvents, primarily for varnish removal, but also for general cleaning<sup>1</sup>. Usually solubility tests started with turpentine oil, sometimes mixed with a drying oil. However, in general, stronger solvents were required. In such cases ethanol was employed (white wine, wine spirit, brandy, alcohol of different purities), added gradually to turpentine oil until the desired effect was obtainable. For paintings with a dry-looking surface, turpentine oil was substituted with drying oil to 'feed' the paint during cleaning. Other solvents mentioned were spike, lavender, cedar, rosemary and lemon oil, but warnings were issued against their aggressiveness. Ether was advised for the removal of overpaint or oil layers, acetone mixed with water to remove resistant varnishes (Anonymous 1850–1859, Vibert 1891). Hampel (1846) advised applying mixtures of turpentine oil, alcohol, poppy oil or copaiba balsam, his so-called 'Putzwasser' [cleanser], to remove resin varnishes. Köster's 'Putzwasser' consisted of turpentine oil, cedar oil, lavender oil and rectified wine spirit (Köster, 1827–1830). Montabert (1829) mentioned egg yolk with a dash of alcohol to soften resin varnishes before removal with warm water or brandy. De Burtin (1846) recommended adding potash to ethanol for resistant areas, although he warned that this could be dangerous.

Most recipes would advise treating paintings by area, applying the solvent (mixture) with cotton wool, silk cloths or brushes. De Burtin (1846) advised

using a dry, soft linen cloth to wipe away the dissolved varnish. However, in a recipe for varnish removal, Thomson (1831) applied ethanol over the whole surface, where it was left for several minutes and rinsed with water.

Some recipes advised using drying oils to halt the corrosive effects of lye or solvents. Firstly, oil would be applied to protect the paint, then the layer to be removed would be attacked with solvents or lye. The area would be dabbed quickly with drying oil to stop solvent action. This sequence would be repeated until the desired result was reached, holding a solvent or lye-filled linen or cotton tampon in one hand, the oil-filled tampon in the other.

### Resistant areas

Authors devoted much attention to the removal of drying oils, copal varnishes or grease layers, all described as very resistant. De Burtin (1846) explained that tough varnishes could be dissolved by applying their liquid version, if left on the surface long enough, combined with mechanical action and heat. The like-dissolves-like principle was also employed for oil layers. Old oil layers would be softened with linseed oil, applied overnight, before removal with alkalis, alcohol or by scraping (Thon 1826, 224). De Burtin (1846) mentioned long exposure to water. Montabert (1829) advised applying a piece of cloth soaked in wine spirit or ether to soften oil or overpaint before scraping it off. The cloth could be covered with a glass or iron plate to prevent evaporation. Horsin-Déon (1851) advised covering such compresses with drying oil; Hampel (1846) and Lucanus (1828) used starch, flour pastes or dough mixed with solvents or water to retain solvents on the surface.

Courtin (1830) advised exposing oil varnishes to turpentine essence and drying oil for several days, then to ethanol with a little potash, before removal by scraping. For copal varnishes, Thon (1826) used pulverised camphor dissolved in rosemary oil, Hampel (1846) advised the use of copaiva balsam additions. Additions of abrasives, like chalk or sand, were also mentioned to clean difficult areas; Hampel (1846) even advised pumicing thick overpaints.

De Burtin (1846) wrote about blanching, for which he rightly blamed moisture. He treated blanching by drying the painting and brushing away the white haze. When the varnish or binding medium had degenerated due to moisture exposure during lining or cleaning, the painting would be fed a drying oil to ‘replace the one which the heat has destroyed’ or would be treated with equal parts of wine spirit and mastic varnish. Hampel (1846) advised drying fungus stains with a warm iron and fungus removal with a dry cloth or brandy.

### Miscellaneous methods and materials

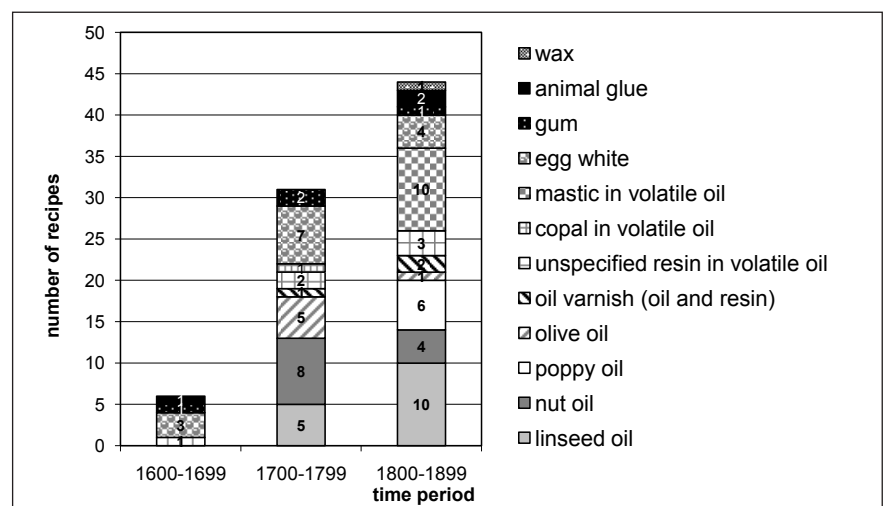
Chomel (1743) and others mentioned cleaning with halved apples rubbed over the surface, but warned against their use. Unsalted butter, animal grease, olive oil, beer, milk, onions, calcium chloride, vitriol or sodium chloride were recommended for stain removal (Thomson 1831, Hampel 1846).

Surface dirt removal with sorrel leaves was executed as follows: the leaves were rubbed on the painted surface to obtain froth. They were removed and the froth was massaged further; it was rinsed away with water and the painting was dried. Then crumbs of stale bread were rubbed over the surface. The treatment was concluded with the application of an egg white varnish (Anonymous 1777). Another curious cleaning recipe advised applying a composition of ox kidney grease, nut oil, lead white and yellow earth to the reverse side of the canvas. It seems unlikely that this would have ‘revived the colours, remove all blackness and render paintings as new’, as the author Grisellini (1771) promised.

### Oil layers or varnish applied after cleaning

The majority of cleaning recipes advised applying a final layer, which saturated colours, ‘fed’ the binding medium or protected the surface (Figure 1). Recipes for final varnishes for restored paintings were often similar to those advised for ‘new’ oil paintings and included resin varnishes with turpentine balsam, mastic or sandarac, some recipes mentioning admixtures of drying oils (Witlox 2001). Horsin-Déon (1851) explained that varnish was sometimes applied warm to increase adherence to old varnish layers. Intermediary varnishes were mentioned by Courtin (1830), who explained that the majority of restorers apply a varnish before retouching. He himself preferred an intermediary oil layer. Other sources mentioned rubbing an intermediary layer of ‘retouching butter’ into the surface. Retouching butter recipes vary from a mixture of drying oil and mastic (Lucanus 1828) to a complicated emulsion of solvents, resins and water, described by De Burtin (1846).

Other final layers were advised: Hampel (1846) mentioned copaïva balsam, animal glue, sturgeon glue and copal, preferring mastic himself. Montabert (1829) advised using a wax varnish, which during subsequent aqueous cleanings would prevent moisture penetration. Concerns about



**Figure 1**

Recipes specifying varnishes or oiling layers to be applied to the surface after cleaning, 1600–1900. Each column represents a century

varnish removability prompted authors to advise the use of gum water or egg white, explaining that these could be washed off with water. Moreover, they could be applied immediately after retouching, whereas resin varnishes required thorough drying of the (oil) retouches. De Burtin (1846) advised applying animal glue for immediate varnishing. Thon (1826) warned against using egg white for this purpose: it would attract moisture, become sticky and attract dust. If applied thickly, eggwhite could flake off, causing cracks. A layered system consisting of egg white over a resin varnish was advised by Simis (1807), since he considered it possible to replace egg white regularly without disturbing the underlying resin varnish.

Even though authors warned that drying oils are the worst possible coating, a surprisingly large number of recipes mentioned oil applications. Raw or sun-thickened linseed oil, nut oil, poppy oil or olive oil were rubbed into the surface of cleaned paintings to restore their lustre, sometimes mixing it with alcohol or turpentine oil before application (De Piles 1767; Hampel 1846). Many recipes advised buffing the oiled surface with a warm cloth. Some authors issued warnings that oil layers should be applied thinly to prevent crust formation on the surface, and De Burtin (1846) advised removing excess oil.

## FUTURE RESEARCH

This overview of cleaning methods has revealed rather shocking treatment procedures. However, descriptions have at the same time shown that authors sincerely cared about paintings, describing possible dangers encountered during cleaning and providing advice aimed at minimizing risks. Future research will focus on the actual effects of the above mentioned treatments. Reconstructions of cleaning recipes will allow for a better interpretation of damage seen in actual paintings. Chemical analyses of reconstructions before and after use of historical cleaning methods will complement the visual information and lead to a better understanding of the influence of past restoration treatments.

## NOTES

1 Nineteenth-century solvents were not as pure as modern solvents. Lucanus (1828) is one of the few sources mentioning exact percentages.

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**Table 1**

Cleaning methods for oil paintings described in written sources, including subsequent varnishing and oiling layers. 1600–ca. 1890

This table provides a general overview of cleaning methods mentioned in historical written sources. It does not represent individual recipes inside these sources.

source	recipe code	cleaning methods										surface layer after cleaning		
		mechanical		methods employing liquids							methods/ materials from categories combined	varnish/ egg white	oil	
(between brackets: number of cleaning recipes in this source)	A = general cleaning B = varnish removal C = oil removal D = surface layer application	rubbing	abrasive	water	lye	soap	urine	solvent	oil/ varnish	miscell. methods				
Anonymous, c. 1620, no page nrs (2)	A				×								×	
Veen, van c. 1650, 59 (1)	A, D		×	×	×							×	×	
Anonymous, 1668, 106–107 (1)	A, D		×		×								×	
Smith, 1676, 74–75 (1)	A, D				×								×	
Anonymous, 1707, F 38 (1)	A, D					×							×	
Hyre, de la, 1730, 722 (1)	A			×		×	×							
Tiquet, 1741, 49–50 (2)	A, D					×							×	×
Chomel, 1743, 950–951 (6)	A, D			×		×	×	×		×	×			×
Pictorius, 1747, 276 (4)	A, D					×	×	×					×	×
D'Arclais, 1765, 229 (2)	B	×												×
Piles, 1767, 171–178 (8)	A, D		×	×	×	×	×	×		×	×		×	×
Griselini, 1772, 282–285 (4)	A, D	×								×			×	×
Anonymous, 1772–1784, 31 (1)	A				×			×		×				
Buys, 1774, 406 (1)	A, D				×	×							×	×
Hubbard, 1775, 116–117 (7)	A, D		×	×	×	×	×	×					×	×
Anonymous, 1777, 184–187 (6)	A, D		×	×	×	×	×	×					×	×
Simis, 1807, 97–102 (6)	A, B, D		×		×	×		×	×				×	×
Thon, 1826, 223–226 (11)	A, B, C, D	×	×	×	×			×	×	×			×	
Köster 1827–1830, I, 18–38 (8)	A, B, C, D		×		×	×		×		×			×	×
Lucanus, 1828, 4–25 (11)	A, B, C, D	×	×	×				×	×	×			×	×
Montabert, 1829, 709–712 (4)	A, B	×		×	×	×		×		×			×	
Courtin, 1830, 158–167 (3)	A, B, C, D	×			×	×		×					×	×
Vergnaud, 1831, 222–230 (2)	A, B, C		×		×	×		×		×				
Bickes, 1834, 132–133 (1)	A, D				×	×	×						×	×
Anonymous, 1836, 186–187 (2)	A, D			×	×	×		×					×	×
Thomson, 1839, 233–236 (6)	A, B, C, D			×	×	×		×	×	×			×	×
Burtin, de, 1846, 251–292 (12)	A, B, C, D	×	×	×	×	×		×	×	×			×	×
Hampel, 1846, 32–80 (17)	A, B, C, D	×	×		×	×		×		×			×	×
Anonymous, 1850–1859, 8–12 (5)	B, D	×	×		×			×	×				×	×
Horsin-Déon, 1851, 61–209 (17)	A, B, D	×	×	×	×	×		×	×	×			×	×
Anonymous, 1854, 48–49 (2)	A, D			×	×	×		×					×	×
Vibert, 1891, 299–302 (6)	A, B, C, D	×		×				×	×				×	