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Historical recipes for preparatory layers for oil paintings in manuals, manuscripts and handbooks in North West Europe, 1550-1900: analysis and reconstructions

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Chapter 7 Application and texture

rub it over with pumicestone (putting your left hand behind the cloth, so as to prevent injuring it)

Osborn 1849²⁸⁸

This chapter explores how preparatory layers were applied, smoothed and dried. Application and smoothing methods influence the visual characteristics of the preparatory system, and have a direct influence on layer thickness, texture and speed of drying.

Through recipes, insight can be gained into the reasoning behind the choice of an application method and application instrument. Contemporary discussions on the topics of application and texture are important for the evaluation of the visual characteristics of aged grounds. In that capacity, these recipes may also help inform conservation decisions.

The chapter follows the order of application of the different layers, discussed individually for the different supports. It ends with a section on drying times and on the preparation of the ground prior to painting.

7.1 Size application methods

7.1.1 Animal glue

In recipes for *panels*, glue is usually applied hot and liquid (see Table 11.2 in Appendix 18). Daniel King (1653-7) describes the method used by a Mr Molon (probably a commercial primer): 'He takes glew and boyles it with as much water as being cold it makes a weake size. With this being warme he layes over a bord'.²⁸⁹ De la Hire in 1730 also provides a recipe for the application of warm glue: 'to prepare wooden planks for painting in oil, they are first glued on two sides with hot glue from leather ... it is put on two sides to make sure that the planks do not deform'. Both sources specify the use of a more viscous size on canvas,²⁹⁰ as opposed to the liquid glues they describe for panels.²⁹¹ Simis (1801) warns that the application of a glue layer 'should only take place on a dry spot and on dry wood, otherwise the glue will soon fall off, together with the paint'.²⁹²

Recipes for *canvas* size layers are more numerous, which results in a more detailed description of this stage. While a number of sources advise 'glue water',²⁹³ other sources

²⁸⁸ Osborn and Bouvier 1849: 114-7. Osborn is paraphrasing Bouvier 1827: 563-6

²⁸⁹ King 1653-7: 52, 52v.

²⁹⁰ King 1653-7: 48, 48v: a thin starch is applied to canvas; De la Hire 1730: 710: gelled leather glue is applied to canvas.

²⁹¹ King 1653-7: 52, 52v; De la Hire 1730: 708-709.

²⁹² Simis 1801: 154-155.

²⁹³ For instance Félibien 1676: 407-8: 'eau de colle'; Bickes 1834: 133-4: 'Leimwasser'; Raycroft 1888: 25: 'thin liquid glue'.

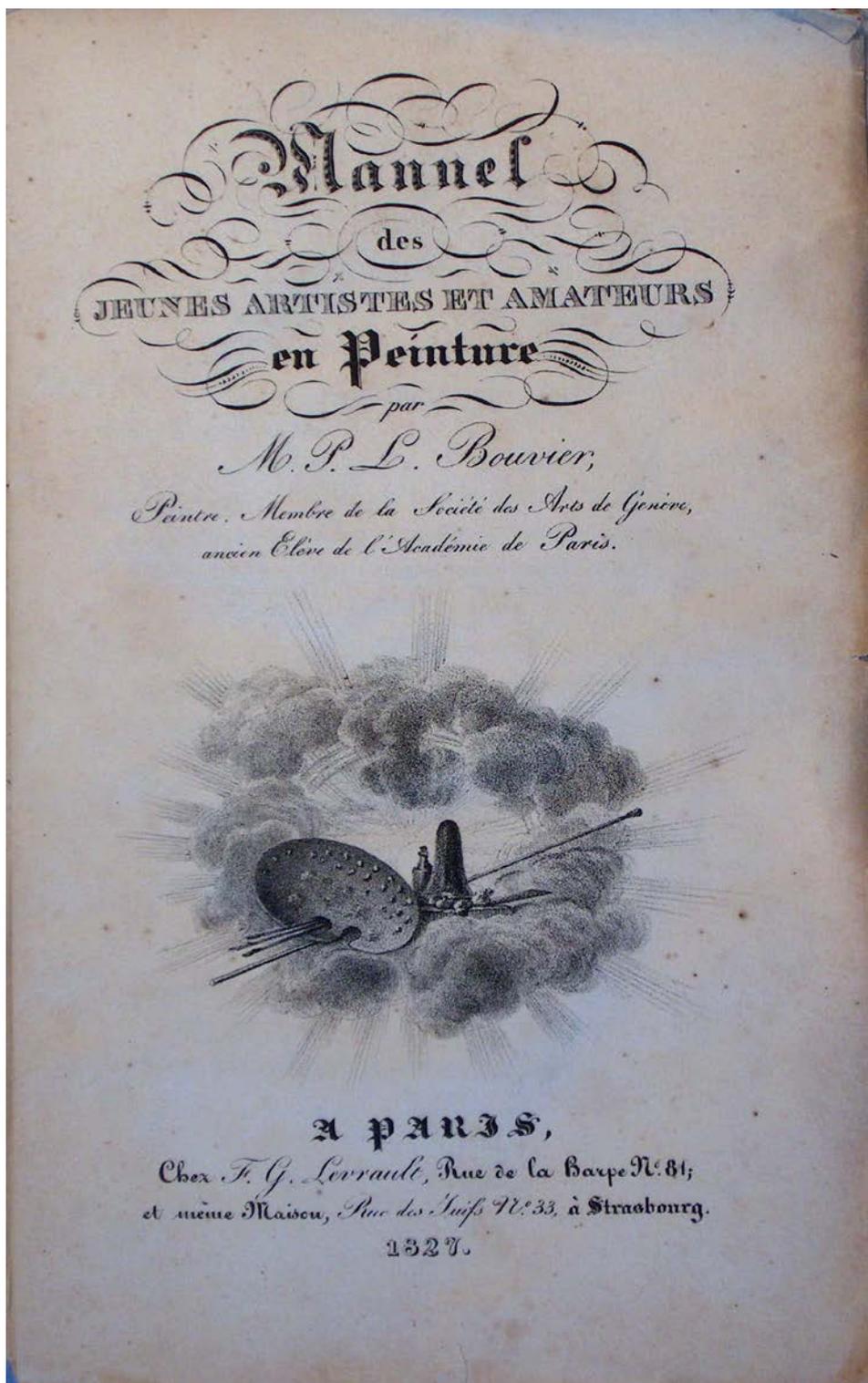


Figure 7.1 Bouvier's (1827) manual on oil painting, includes detailed descriptions of the tools and application methods employed for preparatory layers

Photographed by the author from an original copy of the book in the library of the Van Gogh Museum, Amsterdam.

write about ‘strong glue’²⁹⁴ or ‘averagely strong glue’²⁹⁵ (see Appendix 18, Tables 11.1 and 11.2). For canvas, both warm liquid glue and cold gelled glue are mentioned.

In recipes, much attention is given to the fact that the layer applied to the canvas needs to be as thin as possible, especially when applied as a gel. Excess glue is scraped away from the front but also removed from the back if it has squeezed through. Some authors warn that a thick glue layer causes problems. ‘If it is left it makes [the canvas] burst’, explains Richard Symonds (1650-52).²⁹⁶

For liquid application, no exact glue concentration is given, and generally descriptions include sentences like: ‘use a very weak glue’, ‘use glue water’, or ‘not too strong’.²⁹⁷ Chapter 11 discusses how glue consistency depends on the type of glue, preparation method and ambient temperature. It is therefore logical that no exact percentage is given in recipes for glue preparation, as discussed in Paragraph 11.3.5.

Despite comments on the importance of a thin glue layer in some sources, a few others mention the application of a second layer. Recipes specifying two glue layers appear in both the seventeenth and nineteenth century.²⁹⁸

Normally the glue is applied either warm or cold. So far only one exception has been found. A recipe in the ‘Art of painting in oyle’ (1664) explains:

when it [the glue] is but warme size your cloth (being ready strained on a frame) dipping a brush in your size & rub it on the cloth very well neither too thick nor too thin but between both, & when that is thoroughly dry take the same size being cold & spread it on the cloth that was sized before with a knife very thin as may be and when that is dry it is fit to be primed.²⁹⁹

It is only during the nineteenth century that recipes for glue size layers on paper and (mill)board start to appear.³⁰⁰

No consistent pattern or chronological development in the concentration described is evident, either for animal glue or for flour paste.

²⁹⁴ De Mayerne 1620-44: 90: ‘colle forte’. De Mayerne notes about the preparation with this glue: ‘casse’ (‘breaks’), but describes the use of ‘colle forte’ in two other recipes, in folios 87 and 96; Ibbetson 1803: 11, 1 writes: ‘strong glue’.

²⁹⁵ De Mayerne 1620-44: 5: ‘colle de retailles de cuir ou size qui ne soit pas trop espaisse’; Watin 1772: 190-1: ‘colle de gands de moyenne force’

²⁹⁶ Symonds c. 1650-52: 4v.

²⁹⁷ See Appendix 18, Table 11.1.

²⁹⁸ de Mayerne 1620-44: 142; Volpato c. 1670: 729; Hidalgo 1693: 137; Williams 1855: 10; Dietrich 1871:20.

²⁹⁹ ‘Art of painting in oyle’ 1664: 95-96.

³⁰⁰ See Appendices 9 and 10 .

7.1.2 Flour paste or starch paste

As with animal glue size layers, not all recipes describing flour paste or starch paste size layers include a description of the application method or the consistency. Flour paste or starch consistency descriptions also show variation between individual recipes. Descriptions of flour pastes in Chapter 6 vary from ‘paste water’³⁰¹ to ‘rye flour plaster’³⁰² or ‘porridge [‘pap’] of wheat flour’.³⁰³ Information about consistency can also be derived from a description of the tools employed. These descriptions are included in Appendices 5 to 12.

The nature of flour paste allows both for cold or warm application, however hardly any recipe includes instructions on this topic. The only indication is found in a recipe provided by Sully (1873). It concerns instructions that he has received from artist Rembrandt Peale, and the text describes the application of a hot layer of flour paste, which is prepared ‘the usual way’ and contains some Venice turpentine, to the canvas.³⁰⁴

7.1.3 Oil or varnish size application methods

The few recipes that discuss the application of an oil or varnish size layer, provide some indications of layer thickness. Both Dossie (1758) and Hampel (1846) want to fully saturate the support, as Dossie advises to apply ‘hot oil’ as long as the panel will absorb it and Hampel (1846) to soak the panel in ‘oil varnish’ until it takes not more.³⁰⁵

7.1.4 Application tools

Descriptions of tools for sizing wooden panels are scarce (see Appendix 5). The first recipe that discusses the tool to be used in size application is published by Félibien (1676), who advises to size a panel with a brush.³⁰⁶ According to Fernbach (1834), the size should be ‘dabbed on’ with a brush.³⁰⁷ The Susse brothers (1845) apparently prefer a gelled glue, since they describe the use of a knife.³⁰⁸

In canvas sizing preparation recipes, more information is found about the tools employed for their application (see Appendix 6). As noted in Paragraph 6.1.1, glue size layers are applied either as liquids or as gels.

Knives are often mentioned to apply gelled glue. A detailed description appears in the anonymous *Nieuwen verlichter* of 1777:

This glue is laid on with the sharp side of a large knife which is thin enough, and it is pushed or bent a little in the middle: the knife has a bend towards its back, because there

³⁰¹ *Golden Cabinet* 1793: 112.

³⁰² Friedrich 1871: 21-2.

³⁰³ Eikelenberg 1679-1704: 404-5.

³⁰⁴ Sully 1873: 024-5

³⁰⁵ Dossie 1758: 203-4, Hampel 1846: 26.

³⁰⁶ Félibien 1676: 407-8.

³⁰⁷ Fernbach 1834: 5-6.

³⁰⁸ Susse 1845: 22.

you have your hand to hold it, not touching the cloth when you use it. It has a slightly bent handle, to prevent the hand of the artist from touching the canvas.³⁰⁹

Watin (1772) mentions, in addition to a normal knife, a wooden knife as a tool for the application of a glue of glove-clippings. The glue is first whipped into a froth.³¹⁰ Iron, wooden or bone spatulas are mentioned in other sources.³¹¹

Liquid glue is easy to apply with a brush and there are instructions that specify this method (See Appendix 18, Table 11.2). Soaking or bathing a canvas in liquid glue is described by De Mayerne (1620-44)³¹² and in a recipe in the *Technische Mitteilungen* (1886).³¹³ The *Technische Mitteilungen* (1897) also provides a recipe for a 'new' ground that starts with a canvas or board soaked in milk.³¹⁴

In Pictorius's recipe (1747), thin warm glue water (with the addition of starch) is applied with a piece of cloth dipped in the liquid and rubbed onto the canvas.³¹⁵

Knives and spatulas are also advised for the application of flour paste size layers. Daniel King (1653-7) describes the application of thin starch with a knife.³¹⁶ Eikelenberg (1679-1704) advises knife application in one recipe and in another recipe the flour paste is applied with a brush and evened out with a palette knife.³¹⁷ Cröker (1729) provides a

detailed description of a small wooden plank, thin at the bottom and thicker at the top, that is used as a spatula for the application of flour paste size layers (See Fig. 7.2).³¹⁸ Similarly, Hampel (1846) advises to use a wooden tool, which he describes as a wooden spatula, to apply flour paste. He writes that the wooden spatula should be soaked in linseed oil for twenty-four hours before it is used to apply the flour paste. This pre-treatment renders the spatula slippery or smooth ('Geschmeidig').³¹⁹



Figure 7.2 Cröker's image of a wooden plank for size application

Cröker 1729: 76.

Scan: © <http://www.books.google.com>, digitalized from original in the library of the University of Lausanne

Recipes for the preparation of fibreboards for painting do not include information on the tools employed for the application of size layers. Appendix 9 shows that as for

³⁰⁹ *Nieuwen verlichter* 1777: 166.

³¹⁰ Watin 1772: 190-1.

³¹¹ For example: De Mayerne 1620-44: 98v.

³¹² De Mayerne 1620-44: 98v.

³¹³ *Technische Mitteilungen*, nr. 25 (1886): 39.

³¹⁴ *Technische Mitteilungen*, nr. 9 (1897): 2.

³¹⁵ Pictorius 1747: 355.

³¹⁶ King 1653-7: 48.

³¹⁷ Eikelenberg 1679-1704: 385 (knife), 404-5 (brush and knife)

³¹⁸ Cröker 1729: 74-7.

³¹⁹ Hampel 1846: 22-5.

the other supports, brushes or knives are described to size paper.

7.1.5 Smoothing

The recipes in Appendices 5 to 12 demonstrate that smoothing, pumicing or scraping of the sized support is described both for panel, canvas, board and paper. Horsetail is advised by Cröker (1729) to smooth a sized panel.³²⁰ Knives are frequently advised to remove knots and loose hairs and smooth the surface of the canvas, as is pumice stone.

For smoothing a sized panel only a few references to pumicing are given, whereas scraping with a knife is more frequently described. The *Nieuwen verlichter* (1777) mentions how the surface should be scratched slightly before ground is applied on top, but does not give any description of the instrument used.³²¹

The pumice stone is mentioned as a smoothing tool in nearly all recipes for glue size layers on canvas. It is sometimes used to treat the support before the sizing is applied,³²² but more usually only afterwards. According to the *Nieuwen verlichter* (1777): 'to make it [the size] more even, when it is dry, it is rubbed in all directions with a well flattened pumice stone, to remove all knots and unevenness'.³²³

In most recipes, pumicing is executed on the dry size layer. However in a number of recipes for canvas preparation, the size layer is smoothed while it is still wet. For example De Mayerne (1620-44) includes a recipe from Amsterdam artist Abraham Latombé,³²⁴ who specifies placing the canvas sized with animal glue on a marble plate while it is still wet and then flattening all the seams and knots with a muller,³²⁵ and Cröker's recipe for the preparation of canvas (1729) also advises smoothing wet starch paste with a glass paint muller. After the sized canvas has dried, it is smoothed again with a pumice stone or with 'Sandleder', leather prepared with a layer of glue into which sand particles are sprinkled.³²⁶ Pictorius (1747) and Ibbetson (1803) describe flattening the sized canvas on a flat surface while wet.³²⁷

Instructions in other sources are to pumice the canvas while it is stretched on the same frame used for size application.³²⁸

³²⁰ Cröker 1729: 78.

³²¹ *Nieuwen verlichter* 1777: 170.

³²² See Appendices 6 and 12.

³²³ *Nieuwen verlichter* 1777: 166-7

³²⁴ Abraham de Latombe or Abramo della Tumba or Abramo della Tomba, 1597-1628.

<http://burckhardt.ic.uva.nl/ecartico/persons/4496>, accessed 17-7-2012.

³²⁵ De Mayerne 1620-44: 11.

³²⁶ Cröker 1729: 74-7. Pumicing a wet starch layers is also advised by Ibbetson 1803: 11 and by Fielding 1839: 80-1; according to Thomas Sully (Sully 1809-1871: 020), artist Rembrandt Peale pumiced the bare canvas while wet.

³²⁷ Pictorius 1747: 355; Ibbetson 1803: 11.

³²⁸ Examples are: De Mayerne 1620-44: 20v; King 1653-7: 48; de la Hire 1730: 710; Chomel 1743: 948; *Artist's assistant* c. 1785: 93; Bouvier 1827: 567-70.

7.2 Ground layer consistency and application methods

7.2.1 The ground material: consistency of the ground mixture, the degree of pigment and filler dispersion

Unfortunately very little information about ground consistency is found in historical recipes. Not necessarily on purpose, but maybe more related to the difficulty of description. As written in the anonymous 'Art of painting in oyle' (1664): 'Experience will be your best master'.³²⁹

Chalk and glue ground composition is described by De Mayerne (1620-44) as 'add so much chalk as it takes to make a coating',³³⁰ 'The art of painting in oyle by the life' (1664) describes the consistency as 'reasonably thicke like pappe',³³¹ a consistency also described by Fokke Simonsz (1803-4).³³² Reith (1886) writes that the chalk and glue mixture should be 'almost too thick to be stirred'.³³³

Only Sully (1809-71) provides exact values in a recipe for a chalk and glue containing emulsion with oil, intended for canvas preparation: one ounce of glue, two quarts of water, one pound of whiting and a gill of oil.³³⁴

De Montabert (1829) gives a general description of the consistency, related to the purpose of the layer: the chalk-glue layer should be sufficiently glued to prevent the oil from the paints applied on top from being absorbed, but not as glued as will prevent the oil [paint] from adhering well, or so that the [chalk and glue] layer flakes.³³⁵ He also describes the consistency of a glue-bound ground mixture that contains chalk or lead white or pipe clay, some pigments and a little honey: when the brush is raised from the jar, the mixture must fall in a continuous drip, not interrupted.³³⁶

Fokke Simonsz (1803-4) advises to add extra glue to the first two layers of a chalk and glue panel ground.³³⁷ Also a recipe from A. Reith (1886) reveals the use of varying proportions of chalk and glue, depending on the layer. The canvas is sized with animal glue to which a tiny amount of ground mixture (chalk or white bole in animal glue) is added. Then the proper ground is applied, consisting of one or two coats of the prepared mixture, dabbed on with a large brush. The preparation is finished with a thin application of ground mixture, further thinned down with animal glue. This finishing layer is applied quickly and smoothly with a brush and after drying the ground is pumiced with pumice stone and water, which serves to 'remove all air bubbles, which are unavoidable in ground

³²⁹ 'Art of painting in oyle' 1664: 93

³³⁰ De Mayerne 1620-44: 90v (for panel)

³³¹ 'Art of painting in oyle by the life' 1664: 94 (for panel)

³³² Fokke Simonsz 1803-4: 84-5 (for panel)

³³³ *Technische Mitteilungen*, nr 25 (1886): 39 (for canvas)

³³⁴ Sully 1809-71: 019. The question is whether Sully employs US measures, in which case: 1 fluid ounce = 29,6 ml., 1 quart = 0,946 liters, 1 gill = 118, or UK Imperial measures. In that case 1 ounce = 28,4 ml., 1 quart = 1,136 liters and 1 gill = 142. Carlyle 2001: 545. For the weight of the 'pound', two options are given by Carlyle (2001): Avoirdupois pound: 0,545 kg, and apothecaries pound: 373,2 gr. Carlyle notes that the Avoirdupois system was also adopted in the US early in the 19th century and is still used today. Carlyle 2001: 546-7

³³⁵ De Montabert 1829, vol. 9: 167-8 (for canvas)

³³⁶ Montabert 1829, vol. 9: 168

³³⁷ Fokke Simonsz 1803-4: 84-5

preparation'. The recipe includes the advice that before use, the ground should be covered either with a thin layer of oil paint or with shellac, since due to absorption of paint binder by the ground, the paint applied on top would be underbound.³³⁸ The ground that results from this recipe would have a more strongly bound section near the canvas and at the surface to which the paint layers are applied.

Whether such differences in the ratio of chalk to glue should be considered standard practice is uncertain. No other recipe for a chalk and glue ground describes similar stepped proportions. The recipe appears alongside recipes that do not include such variations. Chalk and glue grounds that consist of multiple coats of the chalk and glue mixture are however frequently described, as demonstrated in Chapter 5, and below, the use of oil-bound layers with different proportions is discussed.

Very few descriptions are present of the consistency of other aqueous ground compositions. Only Sully (1809-71) describes the consistency of a ground mixture consisting of lead white in skimmed milk: as a paste³³⁹ and Hundertpfund (1847) describes the flour paste consistency itself: 'as slightly fluid honey'.³⁴⁰

The consistency of oil-bound ground layers seems to generally resemble oil paint consistency, with some slight variations: Beurs (1692) advises to grind umber with lead white very thick in oil for a ground layer, while De la Hire (1730) describes the oil paint as 'fine and averagely thick'.³⁴¹ The descriptions of the tools employed for the application of oleous grounds in Paragraphs 7.2.2 to 7.2.4 demonstrate that both spatulas and brushes are employed for panel and canvas preparation. This suggests that both more thickly ground and slightly more fluid oil paints are applied.

According to the 'Art of painting in oyle by the life' (1664), the consistency of oil-bound layers in a panel ground should differ according to the position in the layer build-up. 'not[e] that the first time you prime your boards your primer be thin wth oyle, and ... the oyle will glut the boards, that the colours will not sinke when you shall paint on it'.³⁴²

Some nineteenth century recipes also include advice to use different proportions or viscosities in different layers. Ibbetson (1803) in a three-coat ground for panel, writes that the second and third coat should be bound in pure oil, while the first coat has been thinned with turpentine.³⁴³ Hundertpfund (1847) gives similar advice: thin the first layer of oil-bound ground with turpentine, not the second.³⁴⁴

The degree of dispersion of the pigment in the medium does not often receive attention in the recipes. However some recipes refer to the use of more coarsely ground, or just stirred, first ground layers. The 'Art of painting in oyle by the life' (1664) contains the following comment: 'note alsoe that you may prime yor boards or cloths y. 1st time with

³³⁸ *Technische Mitteilungen*, nr 25 (1886): 39.

³³⁹ Sully 1809-71: 176

³⁴⁰ Hundertpfund 1847: 125-7

³⁴¹ Beurs 1692: 19-20; De la Hire 1730: 708-9

³⁴² 'Art of painting in oyle by the life' 1664: 94-5

³⁴³ Ibbetson 1803: 11-2.

³⁴⁴ Hundertpfund 1847: 125-7. The double oil-bound ground is applied over a layer consisting of flour paste and calcined bones.

course colours the next with finer'.³⁴⁵ This is an interesting comment, as it describes a phenomenon that can be observed in some paintings, the use of more coarse preparatory layers and more finely ground pigments in the upper layers.³⁴⁶ Also the Italian Volpato manuscript (c. 1670) contains a description of a two-coats ground of which the first coat is prepared by 'mixing', while for the second coat, the paint 'must be previously ground'.³⁴⁷

7.2.2 Panel grounds

The tools employed for the application and smoothing of chalk and glue layers to panel are given more attention than those employed for the size layer, although they are not always described. If specified, (soft) brushes or wide pencils are mentioned for ground application (see Appendix 5).³⁴⁸ The anonymous Southern French Ms. 640 (c. 1580—1600) is very specific about the type of brush: 'not with a small brush ('pinceau') but with a brush of such a type as if you would like to dab ('poncer)'.³⁴⁹ The same recipe contains a description of how the chalk and glue mixture should be applied in a dabbing manner,³⁵⁰ a method also advised by Fernbach (1834).³⁵¹ De la Hire (1730) warns for the danger of dissolving underlying chalk and glue coats while applying subsequent coats.³⁵²

A number of options are summed up in the 'Art of painting in oyle' (1664):

Some painters white over thin boards wth [with] whitening sized & when it is dry they white it over againe, & when that is also throughly dry, they dip the ball of there hands sometimes in water & smoothe it over by rubbing these hands round about ye till it be smooth for it will make it very smooth Others white there boards with whitening sized then being dry they scrape it, & then white it over againe with off thiner whitening, and scrape it againe.³⁵³

Scraping, polishing sanding or even the use of a plane are advised to smooth chalk and glue layers.³⁵⁴ Both wet and dry smoothing are mentioned, wet methods involving the use of cloths, rags or sponges, or of a wet pumice stone.

³⁴⁵ 'Art of painting in oyle by the life' 1664: 96

³⁴⁶ See for the use of coarsely and finely ground lead white in seventeenth century painting Chapters 13 and 14

³⁴⁷ Volpato manuscript c. 1670 (transcribed in Merrifield 1849 (1999): 731).

³⁴⁸ Manuscript BnF Ms. Fr 640 c.1580-1600: 57 perso 115: 'pinceau'; 'art of painting in oyle by the life' 1664: 94 mentions a 'soft brush'; De la Hire 1730: 708-9 a 'brosse douce'; *Nieuwen verlichter* 1777: 170: 'zagten borstel', Dutens 1779: 62: 'pinceau fort uni'.

³⁴⁹ BnF Ms. Fr 640 c.1580-1600: 57 perso 115. See Paragraph 5.3 and Chapter 13 for the use of flour paste in canvas preparation.

³⁵⁰ BnF Ms. Fr 640 c. 1580-1600: 57 perso 115.

³⁵¹ Fernbach 1834: 5-6.

³⁵² De la Hire 1730: 708-9.

³⁵³ 'Art of painting in oyle' 1664: 97.

³⁵⁴ Scraping with a knife is advised by BnF Ms. Fr 640 c. 1580-1600: perso 114; De Mayerne 1620-44: f11; Peacham 1634: 130; 'Art of painting in oyle by the life' 1664: 94; De la Hire 1730: 708-9; planing by Van Mander 1604: 47v; planing with a joiner's plane, followed by smoothing with a wet cloth is prescribed by Smith 1693: 75; reeds or rushes by King 1653-7: 52, 52v ; polishing with a wet cloth, followed by sanding

Some authors, like Smith (1693), suggest a combination of methods, in Smith's case to first plane the chalk and glue layer and then to smooth it with a rag dipped in water.³⁵⁵ Fokke Simonsz (1803-4) describes how the surface of the last coat of chalk and glue can be brushed with a wet soft brush or cloth to unite its appearance. This will apparently lift off some of the chalk and glue material, as Fokke Simonsz advises rinsing the brush when it is filled up with white. When a sufficiently smooth surface has been obtained and the layer has dried, it is dry-polished with 'shaved grass' or a clean new piece of linen.³⁵⁶ Pumicing the same layer twice is advised by Fernbach (1834), who explains that the first pumicing only removes the roughest textures, while during the second round of pumicing, after the panel has dried thoroughly, it is made 'very smooth'.³⁵⁷

To apply oil-bound layers to the wooden panel, brushes, spatulas (iron or bone) or palette knives are advised. Eikelenberg (1679-1704) describes smoothing the still wet oil-based ground with a rainwater-wetted palm of the hand, with the purpose of massaging the ground into the pores of the wood.³⁵⁸

Application methods can be different depending on the position of the layer: Ibbetson (1803) advises to apply the first layer, which is thinned with turpentine oil, with a brush, while subsequent coats of 'stiff colour', i.e. without turpentine addition, are applied with a palette knife.³⁵⁹ Grandi (1806) also advises a different tool for the application of the first ground coat, in this case a wheat flour-based composition. The recipe describes how the first coat is applied with a pumice stone, 'to incorporate it with the pannel', while a second coat is applied with a soft brush.³⁶⁰

Recipes mention a number of other tools and techniques to smooth oil-based preparatory layers on panel. Feather-polishing is advised by two sources, the anonymous French BnF Ms. Fr 640 (1580-1600) and the 'Art of painting in oyle by the life' (1664). According to the French manuscript, this method 'smooths better than the brush'.³⁶¹ But these two recipes are exceptions. Most recipes advise methods similar to those described for aqueous layers, such as knives or other blade instruments,³⁶² or even a shard of glass (Hampel 1846).³⁶³ A number of recipes describe pumice stones.³⁶⁴

Van Leen (c. 1800) advises polishing with sieved pumice powder and water, applied with a wet woollen cloth. Before pumicing, the ground needs to 'harden' for four to five

with horsetail is advised by De la Fontaine 1679, seconde partie: 27-8; use of the pumice stone described for instance by De la Hire 1730: 708-9. See Appendix 6 for a complete overview.

³⁵⁵ Smith 1693: 75.

³⁵⁶ Fokke Simonsz 1803-4: 84-5.

³⁵⁷ Fernbach 1834: 5-6.

³⁵⁸ Eikelenberg 1679-1704: 403.

³⁵⁹ Ibbetson 1803: 11-2.

³⁶⁰ *Transactions* 1806: 85-9.

³⁶¹ BnF Ms. Fr 640 c. 1580-1600: perso 114; 'Art of painting in oyle by the life' 1664: 94-5.

³⁶² Knives are mentioned amongst others by: BnF Ms. Fr 640 c. 1580-1600: 48 perso 114; De Mayerne 1620-44: 11, 90v; Bate 1633 (1654): 167; Peacham 1634: 130; Norgate 1640 (edition Hardie 1919): 91; Salmon 1672: 141.

³⁶³ Hampel 1846: 26 describes scraping a varnish-bound ground with a shard of glass as an alternative to a shaving knife.

³⁶⁴ Hallen 1761: 321-2; Hampel 1846: 26; Hundertpfund 1847: 125-7; Susse 1886: 16. These same instruments are advised for smoothing in other paint stages.

weeks.³⁶⁵ Pumicing oil-based grounds with a pumice stone and turpentine oil is described



Figure 7.3 Knife used for the application of size and ground layers

De Mayerne manuscript (Manuscript Sloane 2052) 1620-44: folio 5

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by Fernbach (1834),³⁶⁶ and pumicing with pumice stone and linseed oil by Cawse (1840).³⁶⁷

7.2.3 Canvas grounds

Recipes for canvas preparation describe many of the same tools that are advised for the application of grounds to panel. As Appendix 6 demonstrates, spatulas, knives and brushes are the preferred tools for ground application. Knives or spatulas are in fact the only tools mentioned for the application of oil-bound grounds in seventeenth century recipes, and are also advised most frequently in later recipes. Curiously, the Italian *Abecedario* by Orlandi (1719) advises to apply ground with a spoon ('cucciara').³⁶⁸

De Mayerne (1620-44) includes a drawing of the knife employed for ground application in his treatise (Fig. 7.3). The drawing shows a large knife with a curved end. It looks as if it would fit the description of a knife suited to size layer application according to the *Nieuwen verlichter* (1777),³⁶⁹ which was quoted in Paragraph 7.1.4. The sharp end of a flat knife would create scratches in the wet ground, therefore the end is curved. The handle of the knife is raised; this prevents the hand from touching the painting support during ground application. Knives with a bent handle are also described by Arsenne & Denis (1833)³⁷⁰ and in the *Nyt Magazin* (1838).³⁷¹ The Winsor & Newton archive manuscripts mention the use of a 'trowel'.³⁷²

³⁶⁵ Van Leen c. 1800: 18.

³⁶⁶ Fernbach 1834: 5-6.

³⁶⁷ Cawse 1840: 20-1, 26.

³⁶⁸ Orlandi 1719: 480. This description is puzzling. Descriptions of the term 'cucciara' in historical dictionaries so far provide no reason to translate the term in any other manner.

³⁶⁹ *Nieuwen verlichter* 1777: 166.

³⁷⁰ Arsenne and Denis 1833: 335-7.

³⁷¹ *Nyt Magazin* 1838: 261-2.

³⁷² See Appendices 5 to 12.

As for panel grounds, some recipes describe different application tools for different layers. Watin (1772) advises a knife for the first layer but a brush to apply a thin layer of the second ground.³⁷³ Alternating methods are also described in a recipe by Cawse (1822): the first layer of a wheat flour ground is rubbed into the canvas with a pumice stone, the second applied with a brush.³⁷⁴

Brushes are advised relatively often for the application of aqueous ground layers, although also for aqueous grounds knives are regularly mentioned.

Bouvier (1827) advises to use a large varnish brush,³⁷⁵ Hundertpfund (1847) describes the brush hair type to be used for a flour paste bound ground as badger.³⁷⁶ Hopman (1856) also advises a badger brush to apply a probably oil-bound layer, applying the second layer with a dabbing movement.³⁷⁷ Tyrwhitt & McDonald (1868) give a recipe for an oil ground thinned with turpentine that although applied by brush, is evened out by dabbing the wet layer with a folded handkerchief.³⁷⁸ Vibert (1892) advises to use a swallow-tail brush in his recipe for a casein-bound ground.³⁷⁹

Bouvier (1827) gives a very detailed description of the priming process. He describes the dimensions of the pumice stone and of the spatula or brush to be used. He writes that after pumicing, the powder needs to be shaken off the canvas. Bouvier furthermore explains that during the application of an oil-based ground with a spatula, some pressure is required in order to push the ground into the canvas interstices. The canvas should be placed upright, and the layer is to be applied thinly, only covering the canvas interstices. Bouvier warns that if applied too thickly, the canvas will be too heavy, the ground will crack sooner and in addition, 'would also be very expensive'.³⁸⁰

Ursin and Hummel (1838) provide the following description of the application of oil grounds:

The well stretched canvas is now laid down on a table of proper width, and the above-mentioned oil colour applied with a spatula, formed so the blade has the same width as the canvas width, in such a way that one holds the spatula with its sharp side almost perpendicular to the canvas and one pulls and moves the spatula alongside the canvas, this colour is pushed ahead in a heap, so that it also spreads.³⁸¹

This process is easy to picture, although the description of the blade size of the spatula would obviously only match the size of small canvases

³⁷³ Watin 1772: 190-1. The recipe is repeated in later sources, like the *Encyclopedie methodique* 1789: 145; Riffault 1826: 183-4; Vergnaud 1831: 137-8.

³⁷⁴ Cawse 1822: 9-11.

³⁷⁵ Bouvier 1827: 577-80.

³⁷⁶ Hundertpfund 1847: 125-7.

³⁷⁷ Hopman 1856: 135-6.

³⁷⁸ Tyrwhitt and McDonald 1868: 338-9.

³⁷⁹ Vibert 1892: 186-8, 107-8.

³⁸⁰ Bouvier 1827: 567-70.

³⁸¹ Ursin and Hummel 1838: 261-2.

Both for aqueous layers and oil-bound ground layers, similar smoothing procedures are described. Scraping or sanding of the dry ground layer is often performed with knives, pumice stones, pumice powder, sandpaper or its 'predecessors'.³⁸² Polishing by brush is also described, in a recipe in the De Mayerne manuscript (1620-44). This method is advised in a recipe for a double oil-bound ground, of which the first layer is smoothed with a pumice stone while the second is polished with a 'brush or pencil'.³⁸³

According to seventeenth and eighteenth century recipes, knots in the canvas can be removed with a knife or a pumice stone.³⁸⁴ Pumicing is also described as a second step, after scraping with a knife, by amongst others De Mayerne (1620-44).³⁸⁵

Pumice stones are advised most regularly. Bouvier (1827) provides a very detailed account of pumicing: the pumice stone should have rounded edges to prevent damage to the ground, the hand must support the canvas from the back to prevent deformations, less pressure should be exerted when pumicing areas above the stretcher bars, circular movements must be used.³⁸⁶

The pumice stone is often rubbed dry over the ground surface, however Simis (1801), De Montabert (1829), the *Nyt Magazin* (1838), Spon (1879) and the *Technische Mitteilungen* (1886) advise pumicing an oil ground with a pumice stone and water.³⁸⁷ Pumicing with oil, as described for panel, does not feature in recipes for canvas smoothing.

The more recent recipes also describe the use of pumice powder.³⁸⁸ According to the *Nyt Magazin*, pumice powder can be replaced as polishing powder with sand, felt, or with a piece of cork. After pumicing, the canvas needs to be washed.³⁸⁹ Washing of the ground in between ground layers is described by Hampel (1846), who advises a solution of potash and subsequent rinsing with tepid water.³⁹⁰

Bickes (1834) advises to use either a pumice stone or horsetail to smooth a glue-bound ground.³⁹¹ The use of horsetail is not described in any other contemporary sources, but it is also mentioned in a seventeenth century recipe for panel preparation.³⁹²

Cawse (1840) distinguishes between smoothing of the first and second coat of an aqueous ground. The first coat is smoothed with a pumice stone, the second with a hand, dipped in

³⁸² These same instruments are advised for smoothing in other paint stages. (Van Hout 2008: 50) discusses a number of historical sources who describe that the 'deadcolour', according to Van Hout's definition 'the initial stage in the painting process whereby the form and colour of the composition are foreshadowed', should be scraped or pumiced to remove paint accumulations. Van Hout 2008: 79.

³⁸³ De Mayerne 1620-44: 96.

³⁸⁴ De Mayerne 1620-44: 87, 98v; Félibien 1676: 407-8; Eikelenberg 1679-1704: 404-5;

³⁸⁵ De Mayerne 1620-44: 87.

³⁸⁶ Bouvier 1827: 563-4

³⁸⁷ Simis 1801: 158; De Montabert 1829, vol. 9: 159-60; *Nyt Magazin* 1838: 261-2; Spon 1879: 113; *Technische Mitteilungen*, nr. 25 (1886): 39.

³⁸⁸ *Nyt Magazin* 1838: 261-2.

³⁸⁹ *Nyt Magazin* 1838: 261-2.

³⁹⁰ Hampel 1846: 22-5. Washing of finished and dried oil-bound grounds is also described as a preparatory step before a painting is executed, to remove dirt or a greasy layer that hinders paint application. See Paragraph 7.5.

³⁹¹ Bickes 1834: 133-4.

³⁹² King 1653-7: 52, 52v.

water.³⁹³ He does not explain why he advises different smoothing procedures. Pumicing slightly abrades the surface, while polishing with a wet hand partly dissolves the animal glue binder and will probably result in a more shiny and 'closed' looking surface.

Sanding paper, or 'glass paper' is advised for smoothing a flour paste ground by Cawse (1822)³⁹⁴ and for a casein bound ground by Vibert (1892).³⁹⁵ Cawse (1840) describes a block of wood as an alternative to the pumice stone.³⁹⁶

A number of recipes for panel and canvas preparation finish with a layer of pure binding medium on top of the ground layers. For the application of such layers, a brush is advised by Grandi (1806).³⁹⁷ De Montabert (1829) employs the term 'frottis',³⁹⁸ which implies that the oil layer he advises is rubbed into the surface of the aqueous ground.

The position of the canvas during priming or pumicing is hardly ever discussed. When mentioned, it appears to depend on the scale of the painting. Interesting in respect to the position of the canvas is Harley's (1987) paper on priming practices of Winsor & Newton. According to Harley, in the 1920s Winsor & Newton change to vertical canvas priming. This implies that before that date, canvas was primed in a horizontal position. Harley writes that vertical priming results in a less dense priming and that it allows a more economical use of space.³⁹⁹

7.2.4 *Ground application for copper, stone, paper and board*

A specific feature of application methods onto copper, is the fact that the hands are employed to spread or texture the ground (see Appendix 8). Pacheco (1647) advises to spread the colour with the fingers,⁴⁰⁰ and a number of recipes describe how the palms are employed to beat the fresh priming, which results in a 'grain' that will provide better adhesion to the colours subsequently applied.⁴⁰¹ According to De la Fontaine (1679), the fresh ground, applied by brush, should be dabbed or 'beaten' with a linen or cotton cloth to even it out. This would probably also result in a slight texture.⁴⁰²

Dossie (1758), in contrast, prefers a smooth surface and advises to dry the plate in a horizontal position to allow the oil to 'run' and 'polish itself to a high degree'.⁴⁰³ Pumicing the copper ground is also advised by Dossie and by others interested in a regular surface. Hampel (1846) in addition mentions the use of sepia bone for this purpose.⁴⁰⁴

Recipes for the preparation of stone supports for painting unfortunately do not include any information on the tools employed for ground application (see Appendix 7). Recipes

³⁹³ Cawse 1840: 20-1, 26.

³⁹⁴ Cawse 1822: 9-11.

³⁹⁵ Vibert 1892: 186-8, 107-8.

³⁹⁶ Cawse 1840: 20-1.

³⁹⁷ *Transactions* 1806: 85-9.

³⁹⁸ De Montabert 1829, vol. 9: 158.

³⁹⁹ Harley 1987: 81.

⁴⁰⁰ Pacheco 1649: 69.

⁴⁰¹ De la Hire 1730: 709; Hallen 1761: 322; Jombert 1766: 137-8; *Nieuwen verlichter* 1777: 171, Dutens 1779: 62.

⁴⁰² De la Fontaine 1679: 28-9.

⁴⁰³ Dossie 1758: vii-viii, 204-5.

⁴⁰⁴ Dossie 1758: vii-viii, 204-5; Arsenne and Denis 1833: 337-8; Hampel 1846: 28.

for paper preparation include only limited information on the tools used (see Appendix 9). It is interesting to note, however, that although some references are present to the use of brushes, not a single recipe refers to spatulas. Fokke Simonsz (1803-4) describes the process by which to smooth the (glue-based) ground. You have to draw a wet brush over the surface, rinsing out from the brush any chalk and glue mixture that dissolved during the process and is transferred to the brush. After drying, the surface has to be polished with fresh grass or a cloth.⁴⁰⁵

For paper, Bouvier (1827) advises to stretch it onto a wooden board that is kept flat by a crossbar at the bottom and one at the top. Before stretching the paper onto the board, the paper is first wetted and allowed to extend, while the edges are protected to keep them dry. The paper is then glued to the board with the dry edges only. After size application, it is cut off the board with a knife.⁴⁰⁶

Recipes for the preparation of boards for painting (see Appendix 10) describe the use of pumice stone for smoothing the size layer and ground layers. Only Knowlton (1879) describes the ground application method: the second layer of the (oil/turpentine) ground for board is applied with a badger brush.⁴⁰⁷

Bouvier (1827) advises to attach boards to an auxiliary frame during preparation with aqueous grounds in order to keep them flat. Restretching the still humid board would even increase its flatness. After application of the ground, the auxiliary frame is removed.⁴⁰⁸

7.3 Layer thickness and texture in relation to the painting support

7.3.1 General comments about layer thickness

It is difficult to establish exact values for layer thickness from the texts. Besides the number of layers and coatings or applications, the consistency of the material or mixture to be applied as well as after-treatments such as pumicing, polishing or sanding will play a role in determining the final thickness of the preparation. This means that an analysis of the number of applications/coatings or layers is not a secure method to determine layer thickness.⁴⁰⁹ Notwithstanding this limitation, some information on layer thickness may be gathered from historical texts. Although absolute values for thickness cannot be obtained, recipes do provide interesting details on the advantages (or drawbacks) of certain thicknesses and discuss the desired surface structure.

Ground thickness obviously has an effect on the visibility of the characteristics of the support, such as the weave pattern of canvas or the grain of the wood, thus influencing the texture of the final painting. It is not surprising therefore, that historical sources discuss the effects of the choice of (prepared) supports on the texture of the final painting

⁴⁰⁵ Fokke Simonsz 1803-4: 84-5.

⁴⁰⁶ Bouvier 1827: 581-3.

⁴⁰⁷ Knowlton 1879: 30-1.

⁴⁰⁸ Bouvier 1827: 580-1.

⁴⁰⁹ Other, more certain methods to establish layer thickness are to examine the surface of the preparatory layer and to take samples from paintings, although local differences in layer thickness can only be determined through multi-sampling, and sampling 'just for the sake of knowing' is surrounded with ethical questions. Non-destructive techniques are only now entering the field. Villafana et al. 2014

and write about the influence of the ground layers on these characteristics. However one method is not necessarily preferred: as Ludwig (1893) writes: ‘whether the ground must be smooth or raw, depends on the tastes of the painter and on the painting, that the ground will carry’.⁴¹⁰ Layer thickness also influences the ground’s response to changes in relative humidity and temperature. The influence of layer thickness on the ageing and degradation of ground layers is discussed in Chapter 10.

7.3.2 *Wooden panels*

Usually no clear instructions are provided regarding the thickness of preparatory layers for panel. However, a number of recipes contain indications of the layer thickness of chalk and glue layers. For example Van Mander (1604) writes that ‘our modern ancestors before used to whiten their pannels more thickly’.⁴¹¹ Two seventeenth century authors describe the desired thickness, which however seems to vary: the ‘Art of painting in oyle’ (1664) prescribes additional layers of chalk and glue if ‘any of the board appears’, while Beurs (1692) advises scraping off the chalk and glue until only the pores of the wood are left filled.⁴¹² In both recipes, this chalk and glue layer is covered with a second, oil-bound ground layer. In Van Leen’s recipe (c. 1800) for a double oil-bound ground, the second layer is applied six to eight times, which must have resulted in a very thick and smooth system. After drying, this ground is polished with pumice powder and a wet cloth or cotton.⁴¹³

The fact that layer thickness can be much reduced by smoothing is clearly demonstrated by the description of the smoothing process provided by Fokke Simonsz (1803-4), which was discussed earlier in Paragraph 7.2.2.⁴¹⁴ Although Fokke Simonsz’ recipe for a panel ground calls for as many as twelve coats of chalk and glue, the smoothing method, which consists of repeatedly dragging a wet brush over the surface, would significantly reduce the initially thick layer. The fact that the brush takes up a lot of the white is clear from Fokke Simonsz’ advice to change the rinsing water of the brush ‘if it has become too white’. Sometimes a wet cloth is required to reach smoothness, Fokke Simonsz adds.⁴¹⁵

Very few recipes provide information about layer-thickness of oil-based second ground layers (see Appendix 5 for indications of the number of applications and application method). Those seventeenth and eighteenth century recipes that do describe the number of applications, talk of one or two applications of oil-paint, independent of whether a chalk and glue first layer is present or omitted.⁴¹⁶ Fernbach (1834) advises three to four

⁴¹⁰ Ludwig 1893, vol. 2: 216-7

⁴¹¹ Van Mander 1604: 47v.

⁴¹² Art of painting in oyle by the life’ 1664: 94, 97. Beurs 1692: 19-20.

⁴¹³ (Van Leen c. 1800: 18) describes first glowing the lead white in a crucible before mixing it with oil and turpentine.

⁴¹⁴ Fokke simonsz 1803-4: 84-5.

⁴¹⁵ Fokke simonsz 1803-4: 84-5.

⁴¹⁶ See Appendix 5. Painting investigations show that some artists choose to apply oil-bound grounds as homogenous and opaque layers (Noble 2004: 329-335; Hendiks 2006: 89-93), whereas in other cases they are applied thinly as translucent layers over a thick chalk and glue layer (See Hendriks 2006: 89-93 for examples from Haarlem artists). Sixteenth and seventeenth century artists like Brueghel the Elder and Rubens employ such thin, brownish-grey imprimaturas, often applied with deliberate streakiness (See Chapter 15). So far no historical recipes have been found that describe *streaky* imprimatura layers. However pigmentations similar to

applications of lead white and chalk, ground in amber varnish thinned with turpentine oil.⁴¹⁷ Other nineteenth-century recipes advise one or two applications of oil paint, as in earlier recipes.

A number of nineteenth century authors draw attention to the greater degree of finish possible on panels in comparison with canvas.⁴¹⁸ Burnett (1861) advises the use of panel in particular for small paintings, 'as it admits of a greater degree of finish than canvas'.⁴¹⁹ This degree of finish would only be possible on a relatively smooth surface. To achieve such a surface, a larger number of preparatory layers may be required than on canvas, although obviously the smoothness of the support itself plays an important role.⁴²⁰ De Montabert (1829) indeed writes that on panel, more ground layers can be applied than on canvas. Why this is so he does not say, however it is likely that De Montabert feels that flaking due to layer thickness would not occur on a relatively rigid panel.⁴²¹ Belgian colourman Blockx's (1881) advice on the thickness of the panel preparation balances the levelling effect of the ground with a wish for a thin preparation: 'It must be applied in a sufficient quantity to fill the holes of the wood, without forming a thick layer'.⁴²²

Appendix 5 demonstrates that a large number of recipes for the preparation of panel mention scraping or pumicing. This could at first sight be interpreted as a further sign that smoothness is indeed intended and achieved, however careful reading reveals, that although many recipes advise pumicing between the application of different preparatory layers, smoothing is not always mentioned after application of the last layer. Possible brushmarks or marks of a palette knife used to apply the last preparatory layer would therefore not always have been removed.

Examples of the deliberate addition of texture to wooden panels are found in a nineteenth century recipe: De Montabert (1829) prescribes the use of a layer of pumice powder to increase the adhesion of paint layers to the smooth panel. In his recipe for a ground on panel, pumice powder is sprinkled onto a wet (varnish-bound) ground layer. When the layer is dry, all loose powder is shaken off. The somewhat gritty surface will, according to De Montabert, 'produce a grain on the layer which helps the colour to adhere well'.⁴²³ Although scoured and textured panels, scratched with parallel or crossing lines, have been found in paintings dating from the late eighteenth and during the nineteenth century, none of the sources discussed in this dissertation describes their use.⁴²⁴

those seen in Rubens's imprimaturas do appear in historical recipes. It is interesting to note that X-radiographs of Leonardo da Vinci's *Virgin on the Rocks* (panel), 189,5 x 120 cm show many handprints in the imprimatura, indicating spreading or smoothing by hand (Keith et al. 2011: 75).

⁴¹⁷ Fernbach 1834: 5-6.

⁴¹⁸ See paragraph 6.3.1.

⁴¹⁹ Burnet 1861: 3.

⁴²⁰ Later in the nineteenth century, smooth, absorbent wooden boards without a ground layer are mentioned by Grace (1881) as suitable supports for quick sketches. Grace 1881: 86.

⁴²¹ De Montabert 1829, vol. 9: 169.

⁴²² Blockx 1881: 3-4.

⁴²³ De Montabert 1829, vol. 9: 164.

⁴²⁴ See for more information on this topic: Goldberg 1993, Currie 1995.

Tidiness during ground application influences surface structure. This factor is however not often drawn attention to. Only Cröker (1729) discusses the fact that a panel ground (oil-based, pigmentation not provided) should be carefully and cleanly prepared since otherwise it will 'look bad' and cannot be gilded or silvered.⁴²⁵ Although Cröker's focus on tidiness seems sensible, it is puzzling why this author is concerned with gilding at a time when this technique is not often used in oil paintings. This detail could indicate that Cröker's recipe, appearing in a book that also contains information on decorative arts, relates to these disciplines more than to artistic painting.⁴²⁶

7.3.3 Canvas

Depending on the weave, canvas supports can have a more pronounced texture than panel and copper supports. Before the nineteenth century, canvas support texture is not frequently mentioned in the recipes gathered for this dissertation. Symonds (1649-51) notes that the artist Robert Walker has told him that he prefers a 'fine' canvas, since on coarse canvases the Italians apply so much ground that the canvas will crack when rolled.⁴²⁷ This interesting comment introduces the notion that some authors relate the type of canvas to the character of the ground applied.⁴²⁸ Also 'The art of painting in oyle' (1664) prefers fine canvas, 'the finer the better'.⁴²⁹ However as the source does not further define the canvas properties exactly, the question remains which qualities are considered as 'fine' canvas. Talley (1981) counted eight canvas support types in the manuscripts of Charles Beale (1677, 1681): sacking, flaxen cloth, bed-ticking, Dutch cloth, Gentish Holland, onion bag, canvas, and Oznabrug, which Talley all described as coarse jutes or stiff or coarse linens.⁴³⁰ Beurs (1692) writes that the canvas should be as fine 'as strength allowed', which places fineness in another context. It implies that for larger formats, which require a higher strength, coarser canvases need to be tolerated in order to support the weight and the mechanical stress or strain of the larger sized painting.⁴³¹

Only very few pre-nineteenth century recipes are specific about the texture of the canvas *after* ground application (see Appendix 6). De Mayerne (1620-44) in a recipe for a single, lead white based ground, leaves the choice up to the artist: a second application of the layer can be made if the artist desires a more 'united' canvas.⁴³² King (1653-7) writes that after the (oil-based) ground is applied, it should be left one to three hours⁴³³ and then scraped with a knife to remove as much as possible, a practice that will lead to a thin but smooth ground layer. Félibien's (1676) recipe describes the application of a second ground layer as optional for paintings with a larger format but as standard practice for smaller-

⁴²⁵ Cröker 1729: 78. 'Oel-Grund'.

⁴²⁶ The significance or weight that may be attached to such recipes is uncertain. However considering the fact that the materials and layer build-up mentioned matches that of recipes explicitly intended for oil painting merits the mention of the recipe in the present context.

⁴²⁷ Symonds c. 1650-2: 98v.

⁴²⁸ A similar link is made in Mérimée (1830) and is discussed below.

⁴²⁹ 'The Art of painting in oyle by the life' 1664: 95-6.

⁴³⁰ Talley 1981: 283.

⁴³¹ Beurs 1692: 17-20.

⁴³² De Mayerne 1620-44: 11.

⁴³³ In a recipe titled 'a primer', King indicates that the primer should be left on about three hours before scraping, in a recipe titled 'to prime cloth that it waste not', the ground material is left one or two hours before scraping. King 1653-7: 48.

sized paintings, as without it the canvas structure would be disturbingly visible.⁴³⁴ The anonymous *Practical treatise* (1795) advises covering with a paint layer those areas where 'the marks of the trowel are so strong in priming of the cloth' that they would remain visible after a single coat of paint be applied. This needs to be done at least 'before we begin with those parts that we expect to finish at one painting'.⁴³⁵

Early in the nineteenth century, German author Jahn (1803) finds that the pronounced weave of twill or damask woven canvas will in some cases be disturbingly visible.⁴³⁶ He prefers plain weave linen, the strength and coarseness of which should depend on the size of the painting.⁴³⁷

The *Compendium of colours* (1808) relates texture to the subject of the painting. The author notes that portrait painters tend to paint on a rather thin preparation and adds that landscape painters generally prefer a rather smooth texture.⁴³⁸

A relation between texture and subject is absent from later sources, however texture is related to picture size in other nineteenth century sources: like Félibien (1676). Bouvier (1827) relates texture to scale and discusses in detail the different factors that influence texture, starting with the selection of an appropriate canvas. A fine weave is suited for smaller paintings, and canvas choice also depends on the genre and scale of the compositional elements. Bouvier writes that for flower paintings or paintings that contain many smaller figures, a fine weave should be chosen.⁴³⁹ He prefers a less fine weave if the artist paints life-size. He feels that such a weave will not disturb viewers looking from the distance required to perceive the composition and believes that it will provide better adhesion for the paint layers.⁴⁴⁰ For very large paintings Bouvier advises very strong canvases of a coarser weave. The light grain that is always visible on such canvases he does not perceive as disturbing, in fact he considers it favourable. Bouvier says that weave visibility is the reason why the ground should not be applied too thickly to such canvases. His comment that no ground would actually be better, echoes Félibien's remarks. However, Bouvier writes, a ground is required since otherwise the colours will penetrate through the canvas to the reverse and the absence of a ground will make spreading the colours too difficult.⁴⁴¹

In his description of the application of preparatory layers, Bouvier advises relatively thin layers. In the case of aqueous, glue-bound preparations, this will prevent that the 'colour crack'. The ideal thickness for aqueous grounds is reached when 'the threads of the canvas are everywhere evenly closed and covered', while the canvas 'remains half-transparent when looked at from the reverse'. After the ground has dried, it is pumiced lightly.⁴⁴²

⁴³⁴ Félibien 1676: 407-8

⁴³⁵ *Practical Treatise* 1795: 108.

⁴³⁶ Jahn's description of the influence of weave visibility is somewhat unclear. He first mentions 'cloth', 'taffeta' and 'twill', says that cloth and taffeta are seldom used, twill more often. He then says that in the last types, 'flowers' ('das eingewirkte Blumenwerk') may become visible when the oil paints 'settle'. This seems to refer to a woven damask and not to a twill weave. In the remainder of the description of weave visibility he however refers to 'zwillig' again, which is the twill woven canvas. Jahn 1803: 47.

⁴³⁷ Jahn 1803: 47.

⁴³⁸ *Compendium of colours* 1808: 66-7. The comment is repeated by the *Complete Guide* 1841: 41.

⁴³⁹ Bouvier 1827: 545-6.

⁴⁴⁰ Bouvier 1827: 545-6.

⁴⁴¹ Bouvier 1827: 545-6.

⁴⁴² Bouvier 1827: 577-80.

Bouvier explains elsewhere that oil grounds should also be applied thinly, only to cover the threads.⁴⁴³

Mérimée's treatise (1830) demonstrates that this author also sees a correlation between the thickness of ground and the coarseness of the canvas weave. According to Mérimée's writings, only a coarse weave canvas requires a size layer.⁴⁴⁴ If no size layer is applied, three or four coats of ground will be needed for an even surface however, while a sized canvas only requires two or three.⁴⁴⁵

Templeton (1849) writes that a ground should be 'moderately thin, so that the texture of the cloth should be scarcely, or not all, perceptible'.⁴⁴⁶ *Reeves and Sons' Amateurs and artists' companion* (1852) deal with the choice of canvas and weave visibility as follows: 'the fineness of the cloth should be proportioned to the size of the picture, and the subject to be painted. For a cabinet piece the surface cannot be too smooth. The cloth should be free from all irregularities. The ground should be moderately thin, evenly laid, and without streaks'.⁴⁴⁷ Blockx (1881) prefers a smooth ground, enough to fill the holes but not to make a thick layer.⁴⁴⁸

Ellis (1883) writes that although a slight texture will help adhesion, 'a rough-surface canvas marks the work to a certain extent, and makes the pupil think his work is better than it is. The texture should be given by the work'.⁴⁴⁹

Whereas according to the *Practical treatise* (1795) irregular areas of the ground should be covered locally to prevent visibility of the texture of the preparatory layers, a small number of nineteenth century sources advise to *add* texture to the ground in some areas of the painting.⁴⁵⁰ For example in his handbook for amateurs, Tyrwhitt and MacDonald (1868) write that for a sketch or picture painted in 'one painting', the amateur artist is advised to apply a thick layer of flake white oil paint with a little ochre or cadmium yellow and some red lake, thinned with turpentine oil. Before dry, the layer is dabbed with a piece of linen to unite its texture, but in the sky and distance a little more of the texture of the brush used for application may remain.⁴⁵¹ As noted by Carlyle (1991, 2001), Grace (1881) is interested in the opposite effect and advises leaving the texture of the ground as smooth as possible for skies, whereas the ground can be 'thicker and more broken in texture as you get nearer the foreground'.⁴⁵² However Hareux (1888-9) has the same

⁴⁴³ Bouvier 1827: 567-70.

⁴⁴⁴ Mérimée 1830: 242.

⁴⁴⁵ Mérimée 1830: 242-3.

⁴⁴⁶ Templeton 1845 writes that millboards, designed for sketching, usually have a slightly granulated surface, which better suits the 'bold and broad style in which sketches and studies' are generally executed. Templeton 1845: 12-13

⁴⁴⁷ *Reeves and sons' amateurs' and artists' companion* 1852: 50.

⁴⁴⁸ Blockx 1881: 3-4.

⁴⁴⁹ Ellis 1883: 42-3.

⁴⁵⁰ Callen (2000) mentions the use of pre-textured grounds by so called 'Salon Impressionists' and later nineteenth century naturalist painters. Callen 2000: 61.

⁴⁵¹ Tyrwhitt and McDonald 1868: 338-9. Tyrwhitt wrote most of the handbook, McDonald only wrote a chapter on perspective.

⁴⁵² Grace 1881: 87. Carlyle 1991, vol. 1:250, Carlyle 2001: 179. It should be noted here, that the word 'ground' is by some writers used in a wider sense that includes the first lay-in of the composition, which in this dissertation is not considered as part of the preparatory system. The context of Grace's recipe seems to

advice as Tyrwhitt and McDonald. He suggests that when painters apply their own ground layer to commercially prepared canvases, they can add impasto to areas that require more texture, and gives the sky as an example.⁴⁵³

A number of nineteenth century sources describe the practice of sprinkling powder into the wet canvas ground surface. Similar practices for panel preparation are discussed in Paragraph 7.3.2 and Chapter 5. De Montabert (1829) advises to sprinkle pumice powder into a still soft varnish-bound ground, a practice that he had heard about in relation to encaustic painting and about which he feels that it will both help adhesion and execution of the painting.⁴⁵⁴ Although not intended for oil painting, Kingston's 1835 recipe for the preparation of supports for 'Grecian painting' is interesting in this context: marble powder is sifted over the wet/tacky lead white and oil ground, and superfluous powder dusted off after drying.⁴⁵⁵ According to Sully (1809-71), American artist Neagle adds a gritty texture to his ground by sifting 'fine sand procured at the marble cutters' onto the wet paint. After drying, the canvas is pumiced.⁴⁵⁶

Hampel (1846), in a recipe intended for those wishing to finish painting in a single layer, advises the application of a layer of sieved pumice powder. This is supposed to render the surface raw and is said to ensure fast absorption of the oil binder of the paint.⁴⁵⁷

During the nineteenth century, commercially prepared supports with different textures or degree of finish are available. Callen (2000) provides an overview of qualities available in France, where canvases 'à grain' are prepared with one layer of ground and show a distinct canvas weave, while canvases 'à lisse' are prepared with two or more ground layers and are more smooth.⁴⁵⁸ Carlyle (1991, 2001) describes canvas qualities available in Britain and mentions the probably comparable canvas qualities called 'single' and 'double' or 'full' primed,⁴⁵⁹ as well as the availability of millboards with different finishes, although she notes that little information is available on this topic in British nineteenth century handbooks, manuals and colourmen's catalogues.⁴⁶⁰ The fact that by 1892 oil sketching paper is available with an imprinted canvas texture (Both Scott Taylor 1890 and Standage 1892 describe this type of paper), shows the fact that around that time, canvas texture is certainly a valued characteristic.⁴⁶¹

indicate that in the text quoted here he is discussing an overall-applied layer. However in this case the border between a preparatory layer and the first stages of setting the composition is rather fuzzy.

⁴⁵³ Mentioned in Callen 2000: 61.

⁴⁵⁴ De Montabert 1829, vol. 9: 164

⁴⁵⁵ Kingston 1835: 3-5. Kingston's method for 'Grecian painting' consists of applying pigments with a sponge and water. The pigments are fixed with a dilute varnish after drying. See Carlyle 1991, vol. 1: 177-8 and Carlyle 2001: 124 and Paragraph 6.5.

⁴⁵⁶ Sully 1809-71: 025. A related practice is reported on by Haaf (1987), who describes an early twentieth century recipe for the addition of cotton fibers to a ground suitable for pastel, gouache, aquarel and oil painting. The structure of the fibers influences the surface characteristics. This type is reported by Haaf as having been used by a commercial company during the early twentieth century, as a linen for pastel painting. (Haaf 1987: 45)

⁴⁵⁷ Hampel 1846: 22-3.

⁴⁵⁸ Callen 2000: 33, 67.

⁴⁵⁹ Carlyle 1991, vol. 1: 250, Carlyle 2001: 179.

⁴⁶⁰ Carlyle 1991, vol. 1: 259-61; Carlyle 2001: 188-9.

⁴⁶¹ Scott Taylor 1890: 33; Standage 1892: 77. Both in Carlyle 1991, vol. 1: 263. See also Carlyle 2001: 189-90. Carlyle discusses the oil sketching papers with different weave patterns available from Winsor and Newton between 1886 and 1900: 'plain canvas, single primed, roman and ticken'.

In nineteenth century France, structured oil sketching paper and boards are also available, as well as boards covered with canvas.⁴⁶²

7.4 Preparing the primed support for painting

After supports with an oil-bound ground have spent enough time in the studio or elsewhere to permit them to dry and age sufficiently, some authors write that the grounds require treatment before use.⁴⁶³ Carlyle (1991, 2001) lists a number of reasons given in nineteenth century sources: the presence of a greasy layer on the ground surface, the freshness of the oil in the preparatory system, reduction of the ground's absorbency and sealing of lead compounds in the preparatory system from subsequent layers.⁴⁶⁴ The present research would like to add lack of smoothness to this list, as the following paragraphs will demonstrate that enhancing the smoothness of the preparation is included as a reason for preparatory measures before painting.

Historical recipes demonstrate that the necessity of pre-treating the primed support is noticed early in the period under consideration.⁴⁶⁵ Already the c. 1580-1600 French manuscript BnF Ms. 640 notes: 'when the ground is made a long time ago it becomes greasy and it must be rubbed with ashes and water'.⁴⁶⁶ A variety of methods are described. The *Excellency of the pen and pencil* (1668) focuses on smoothness in its advise to scrape the primed canvas with a knife before use, since the presence of knots will 'disryme your work'.⁴⁶⁷ Ibbetson (1803) advises rubbing with powdered pumice stone and a little water for a different reason, to make sure that the watercolour toning layer and underdrawing he describes will stick to the preparatory layer.⁴⁶⁸ Sully (1809-71) in his manuscript enters a note in 1819 that describes the practice of a Mr Shaw. This artist apparently covers a canvas with 'a thin coating of whiting in order to absorb the grease, or other offensive matters on the surface'. The layer is washed off after twelve hours and the composition set up in watercolour.⁴⁶⁹ Bouvier (1827) advises painters to pumice an oil-primed canvas before use to remove the oily top layer. He writes that if the canvas has been kept in the dark, this layer will often have discoloured to an orange tone. After careful pumicing, the canvas requires washing to remove all dust and dirt, it is then wiped dry with a clean linen cloth. Bouvier explains that if pumicing and washing are not performed, the canvas will be difficult to paint on since the colours will not adhere well to a greasy layer. After the treatment, the artist is advised to expose his canvases to the air and even to the sun during summer.⁴⁷⁰ De Montabert (1829) prescribes pumicing the ground before use and advises to degrease it with cotton wool soaked in wine spirit.⁴⁷¹

⁴⁶² Callen 2000: 27, 29.

⁴⁶³ see Chapter 10 for author's comments about the importance of well-aged (oil) grounds

⁴⁶⁴ Carlyle 1991, vol. 1: 278-82; Carlyle 2001: 205-7.

⁴⁶⁵ Van Hout 2008: 50 discusses pre-treatments of dead-coloured paintings before the next layer is applied that employ methods and materials similar to the ones described in the present section.

⁴⁶⁶ Manuscript BnF Ms. Fr 640 (c. 1580-1600): perso 2.

⁴⁶⁷ *Excellency of the pen and pencil* 1668: 100.

⁴⁶⁸ Ibbetson 1803: 12 in Carlyle 1991, vol. 1: 285; Carlyle 2001: 209. The watercolour underdrawing is saturated with linseed oil before painting.

⁴⁶⁹ Sully 1809-71: 066.

⁴⁷⁰ Bouvier 1827: 563-6.

⁴⁷¹ De Montabert 1829, vol. 9: 162.

Hampel (1846) also prescribes washing of the canvas, but with a sponge dipped in a potash (a potassium salt) solution and subsequently rinsed with water to remove the potash. This treatment he considers ‘almost essential’ and is indeed supposed to remove the oily layer that has formed on the surface of the ground.⁴⁷²

As discussed by Carlyle (1991, 2001), Templeton (1845, 1849) believes that the greasy layer consists of a deposit from the air, as opposed to an extrudate from the ground itself.⁴⁷³ He writes that this grey layer is capable ‘greatly to retard, and often altogether to prevent the drying of the colours that are laid on them’. For removal, he advises using pumice powder with a cotton wool rag, then washing the canvas with a weak solution of lead acetate. After the surface has dried, another treatment with pumice powder is advised before the surface is ready for use. Templeton mentions that others use ‘pea meal mixed with cold water’ to remove this layer.⁴⁷⁴ Burnet (1861) advises a treatment similar to the one mentioned by Sully: to wash the surface of the ground with a little chalk and water, ‘which removes grease, and makes the colour flow easily’.⁴⁷⁵ Blockx (1881) recommends the use of soap water and a rigid brush, writing that simply rinsing with water or turpentine essence does not suffice. After the panel or canvas has dried thoroughly, wetting with a mixture of oil and turpentine oil will assure a good adhesion between the paint and the preparatory layers.⁴⁷⁶ An anonymous author in the *Technische Mitteilungen* (1891) advises to rub the surface of the stretched primed canvas with a clean linen cloth to remove the ‘somewhat powdery particles’ that come off the preparatory layers after stretching.⁴⁷⁷ Ellis (1897) advises wetting the surface, cleaning with either water, turpentine or a brush and soap until ‘water will stick evenly to the surface all over’. After cleaning, ‘a little fresh oil’ is applied to the canvas.⁴⁷⁸ Finally, chemist Church (1890) advises to bleach yellowed grounds with blotting paper saturated with hydrogen peroxide.⁴⁷⁹

Absorbent grounds receive pre-treatment as well. As will be discussed in Chapter 10, sometimes an oil, glue or varnish layer is applied before use of an absorbent ground, both to lower its absorbency and to facilitate spreading of the colours. Such layers can apparently change the absorbency to a high degree. For instance Cawse (1840) writes that by applying a ‘coat of light coloured drying oil’, which is ‘left to dry before it is used, the ground will become an oil ground, like the canvases which are prepared at the artists’ colour shops’.⁴⁸⁰

A recipe provided by Field (1835) holds a special position. It concerns a remedy for badly drying canvases. To solve this problem, Field tells his readers to sponge the ground surface with a solution of lead acetate (‘sugar of lead’) in water before use.⁴⁸¹

⁴⁷² Hampel 1846: 22-3.

⁴⁷³ (Carlyle 1991 vol. 1: 279; Carlyle 2001: 205) mentions that in a later edition, (Templeton 1885: 18) specifies the layer as ‘similar to that which may be observed on the glass of windows that have not recently been cleaned’.

⁴⁷⁴ Templeton 1845: 13-14; Templeton 1849: 13-14.

⁴⁷⁵ Burnet 1861: 3.

⁴⁷⁶ Blockx 1881: 25-6.

⁴⁷⁷ *Technisch Mitteilungen*, nr. 112 1991: 8.

⁴⁷⁸ Ellis 1897: 186-7 in Carlyle 1991, vol 1: 281; Carlyle 2001: 206.

⁴⁷⁹ Church 1890: 26.

⁴⁸⁰ Cawse 1840: 20-1.

⁴⁸¹ Field 1835: 214.

7.5 Concluding remarks

As described in the introduction to this chapter, the effect that artists intend to reach by applying the preparatory layers in a certain manner is in some cases difficult to separate from the effects of time and of former restoration treatments that are also observed during the investigation of an aged painting. Information from written records contemporary to a painting under investigation is extremely helpful, as it provides indications of the tools employed for ground application and smoothing and in addition also informs investigators about the considerations that steered the choice in techniques, and about effects that artists may have intended to achieve.

The records of application and smoothing procedures that have been gathered and analyzed in the present chapter provide an overview of the chronology in the use of tools and techniques for the application of sizing and ground layers. While Carlyle (1991, 2001) discussed the application methods described in British nineteenth century sources, similar information from earlier sources and from a wider geography was not previously gathered and analyzed.

This chapter demonstrates that the requirements placed on the support regarding texture and thickness, do not seem to undergo strong changes throughout the period. For instance the notion that aqueous layers on canvas need to be applied thinly to prevent delamination is present in earlier recipes as well as more recent recipes. References to a deliberate addition of texture that relates to the composition of the painting, however, are not present in pre-nineteenth century recipes. While many of the tools described in this chapter have been mentioned in previous research, the fact that a block of wood was considered for smoothing preparatory layers, is new.

Application methods and layer thickness have, in the minds of the authors of recipe books, an effect on the long-term stability of the preparatory system. This connection turns out to be strong, authors discussing layer thickness, texture and smoothing in relation to the adhesive properties of the ground. Chapter 10 focuses on authors' advice regarding the ageing and degradation of preparatory layers and returns to this topic.