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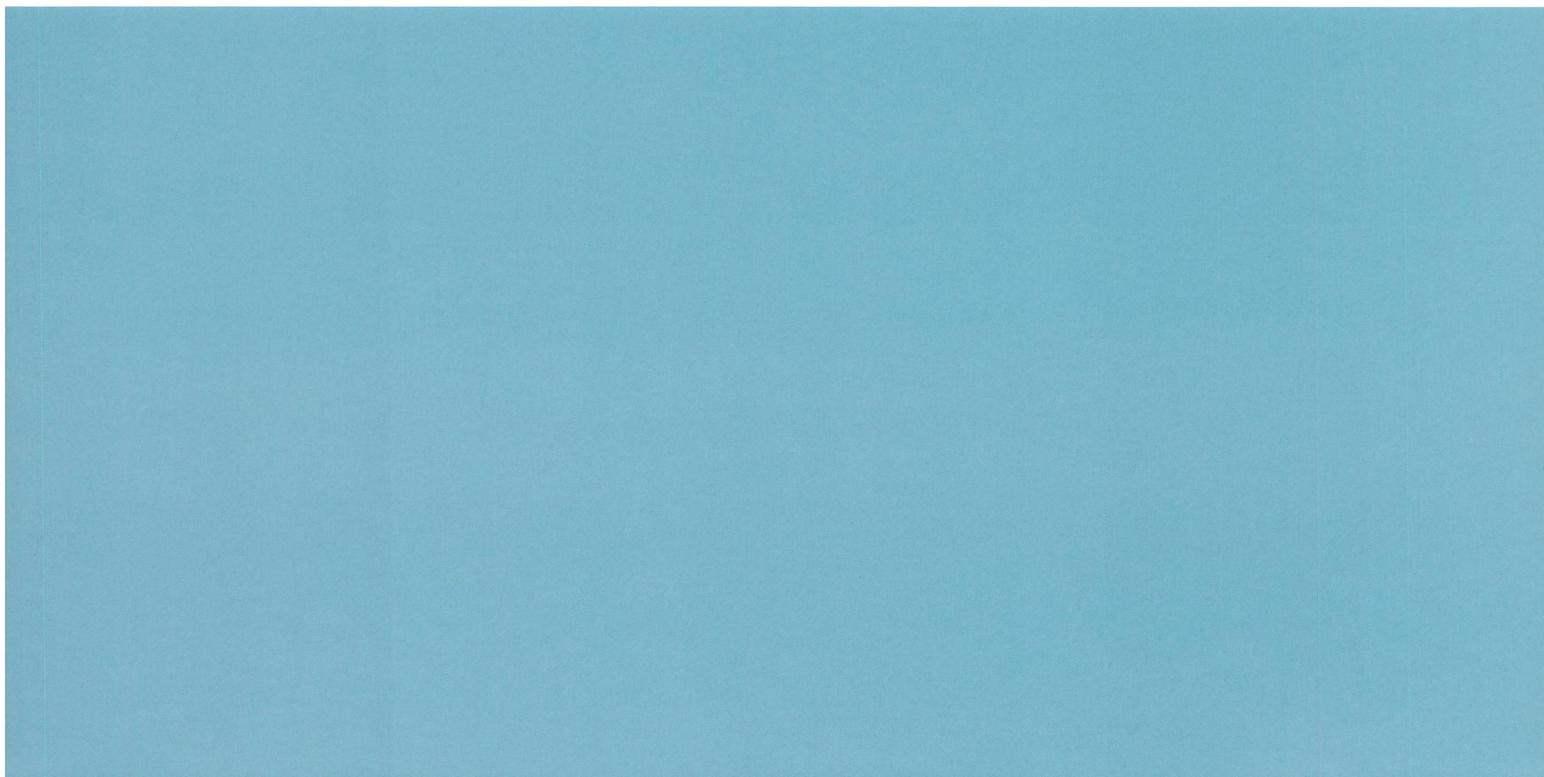
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The Pereira tempora system

Karoline Beltinger



INTRODUCTION

In the territory of present-day Germany, the turn of the 20th century was an especially active time for the introduction of new artists' paint formulations. The launch of a new product was generally accompanied by fervent praise from its manufacturer, intense testing by artists, and close scrutiny and appraisal by paint chemists. While the demand for new products was high, many were greeted with criticism and controversy. In this inherently contentious context, the launch of the so-called 'Pereira tempera' was probably that which was surrounded by the nastiest polemics.

Pereira tempera paints were invented by a high profile figure, the Austrian baron Alfons Ludwig von Pereira-Arnstein (1845–1931) (Figs 1 and 4). In his youth, Pereira served with the navy of the Austro-Hungarian monarchy, assumed office within the Austrian Foreign service in 1873 and was subsequently employed in a succession of his country's embassies. His first posting was in Rome at the Holy See, followed c. 1880 by Stuttgart (then capital of the Grand Duchy of Württemberg); from c. 1898 he spent a short while in Tunis (then capital of the French protectorate) and from 1899 he was again posted to Stuttgart. In 1907 he retired and returned to the city of his birth, Vienna (Phillippi 1972, p. 124; Mentschl 2001).

Pereira's professional duties apparently allowed him plenty of leisure time. Not only was he an amateur painter, he pursued yet another interest: the reconstruction of the historical 'tempera technique of the masters of the Renaissance', as he put it in the title of one of his early publications (Pereira 1891b). Pereira's views on this subject were based on his belief in the veracity of Giorgio Vasari's (1511–1574) account of early European painting technique. As Vasari wrote in his work, *Le vite de' piu eccellenti pittori, scultori e architetti* of 1550/1568, oil had not been used as a vehicle for painting before Jan van Eyck 'invented' oil paint in the early 15th century, after which time the Fleming's invention had subsequently been adopted throughout the European continent. In the following centuries, the exact nature of Van Eyck's



Fig. 1 Print captioned: *Royal-imperial midshipman Alfons Baron von Pereira*. After a watercolour by Joseph Kriehuber from the year 1867. (Reproduced from Pereira 1906, p. 1.)

manner of painting remained a point of contention among scholars (Effmann 2006). Pereira was convinced that Van Eyck's medium was very unlike that which was used for oil painting in the late 19th century and indeed, that it was far superior. In the 1870s he began to seek out Old Master paintings in Rome (then his place of residence) and on his journeys through Italy, France, Germany and England in order to closely scrutinise them. He created copies, studied historical technical sources¹ and even carried out technical examinations of old pictures (which, according to his own words, he destroyed in the process) (Pereira 1891b, p.10). Eventually he concluded that Van Eyck had essentially continued to work

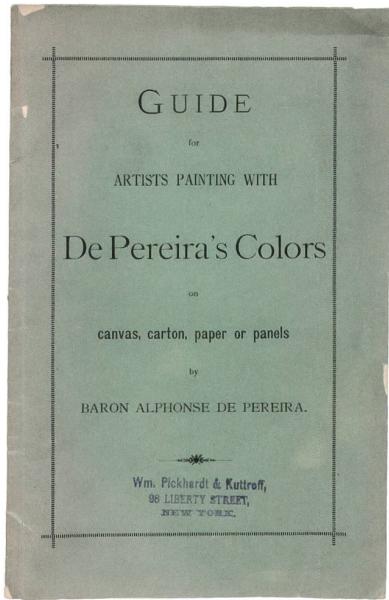


Fig. 2 Brochure *Guide for Artists Painting with De Pereira's Colors on Canvas, Carton, Paper or Panels* probably printed in 1892 (Pereira 1892e), title page.

with an oil-free tempera medium and that his famous 'invention' had simply consisted of a final application of oily or resinous glazes to his tempera compositions. This was the method, he concluded, that had subsequently been adopted by leading artists on either side of the Alps. Pereira was convinced that he could recognise this technique by eye as that used by artists such as Mantegna, Gentile Bellini, Dürer, Raphael, Titian, Tintoretto and Veronese, but also as that employed by later artists including Rubens, Rembrandt and others, right up to the 18th century (Pereira 1909, pp. 5, 8, 12, 13). Oil paint in the modern sense of the term had, according to Pereira, only come into general use after the Napoleonic wars (Pereira 1891b, p. 8). Based on this conviction and his 'innumerable' tests and experiments, he developed an elaborate tempera-based painting system which, he claimed, resembled very closely that used by the Old Masters (Pereira 1891b, p. 10). In 1889 and 1891 he managed to obtain three German patents to protect various features of his system (Patents DE54511 and DE65057, 17 November 1889; Patent DE65274, 22 December 1891; see

also: *TMM* 1891; Pereira 1892h; Pereira 1893b). In addition, he also published a compilation of texts on his discoveries (Pereira 1891b) to coincide with the launch of his range of painting materials.

PRODUCTS LAUNCHED BETWEEN 1891 AND 1897 AND THEIR COMPOSITIONS

At first, for a very short period, Pereira's products seem to have been manufactured by Carl Kreul in Forchheim near Nuremberg (Zechmeister 1890, p. 206; Pereira 1891a, p. 43), but from 1891 onwards their production was taken over by the manufacturer Johann Gottlieb Müller in Stuttgart (Linke 1910, p. 135; see also Figs 6 and 7). Their official German trade names remain unclear, as Pereira himself used several name variants in his many publications (Tables 1–3) and no original containers, labels or images of his products are known to survive. The names used for the current study are those that appear in a contemporary English translation of one of Pereira's advertising pamphlets, although not quite all of his products are mentioned therein (Pereira 1892e, pp. 5–8, 14; see also Fig. 2).

As far as could be reconstructed from contemporary sources, the following products intended for easel painting were introduced in 1891 (see Table 1): as supports there were 'Albumen canvas' and 'Majolica canvas'. These were textiles of one of two different densities, coated either with 'Albumen preparation' or 'Majolica preparation', the first recommended for portraits and interiors, the latter for *plein-air* painting (Pereira 1891b, appendix pp. 1–6; Pereira 1892e, pp. 4–9, 14; Pereira 1893a, pp. 9–16; Pereira 1909, pp. 62–76, 80–92; *TMM* 1892, pp. 29–33, 55–57; Schlichtegroll 1897, pp. 32, 37, 39, 40, 57, 58). As demonstrated in Table 1, albumen preparation was mainly egg white; it contained no solid materials and must therefore have existed in one shade only. Majolica preparation was bound with size and starch (see also Table 1), and was available in several tones: white, brown and three shades of grey called 'bigia', 'biso' and 'pagonazzo'. These, Pereira noted,

FUNCTION	PRODUCT NAMES AS USED IN PEREIRA 1892e	PRODUCT NAMES AS USED IN PEREIRA'S GERMAN TEXTS	BINDERS CONTAINED IN PRODUCTS AS MENTIONED IN CONTEMPORARY SOURCES	REMARKS
Prepared canvas	Majolica canvas	<i>Majolikaleinwand</i>	Canvas pre-primed with <i>Majolika-präparation</i> containing size, starch 'gained from a material from Japan', honey (<i>barium sulphate and zinc white as fillers in Majolikapräparation</i>)	Pereira uses the misleading term <i>Majolikaerde</i> (majolica earth) for barium sulphate
	Albumen canvas	<i>Albumenleinwand</i>	Canvas coated with <i>Albumenpräparation</i> containing egg white, size and honey (<i>no pigments or fillers in Albumenpräparation</i>)	–
Vehicle	Tempera mixing fluid (No. 1)	<i>Malmittel, einfaches Malmittel, Temperamalmittel</i>	Sturgeon glue, water, vinegar, phenol, an essential oil	'Tempera mixing fluid (No. 1)' and 'Tempera siccative (No. 2)' are very similar, but 'Tempera mixing fluid (No. 1)' is weaker (contains less binder), 'Tempera siccative (No. 2)' is stronger (contains more binder). Despite its name, the latter is not a siccative!
	Tempera siccative (sic) (No. 2)	<i>Siccative, Siccativ Pereira, Tempera-Siccative</i>	Goatskin size and/or parchment glue, water, vinegar, phenol, an essential oil	
	Tempera resin medium (No. 3)	<i>Harzmedium, Tempera-Harzmedium, Kirschharzmedium, Temperamedium</i>	Cherry gum, almond gum ('Amygdalarharz')	Study of the sources reveals that the same product was referred to by four different names in the German texts. Despite the composition implied by these names (and by the English translation), it may not have contained resin, but it clearly did contain gums
	Resin medium (No. 110)	<i>Harzfarben-Malmittel</i>	Copaiba balsam, turpentine, resins, essential oils	–
Paint	Majolica colors (sic)	<i>Majolikafarben</i>	Glycerine, honey, small amounts of size and starch, phenol, barium sulphate, pigments	These pigment pastes were to be combined with 'Tempera mixing fluid (No. 1)', 'Tempera siccative (No. 2)' or another compatible vehicle. The production of 'Majolica colors' seems to have ceased before 1909. 'Tempera colors' and 'Majolica colors' are very similar in terms of their organic constituents (the
	Tempera colors (sic)	<i>Temperafarben</i>	Glycerine, honey, gum, small amounts of size and starch, phenol, pigments	

FUNCTION	PRODUCT NAMES AS USED IN PEREIRA 1892e	PRODUCT NAMES AS USED IN PEREIRA'S GERMAN TEXTS	BINDERS CONTAINED IN PRODUCTS AS MENTIONED IN CONTEMPORARY SOURCES	REMARKS
Paint				'grinding vehicles'). 'Majolica colors' contain 'Majolikaerde' (barium sulphate, see above)
	Two white paints; no contemporary translation was found for their names. (Literally translated: 'Binding Medium Paints', 'Binding Medium White' and 'Binding Medium Lead White'.)	<i>Mediumfarben</i> , <i>Mediumweiss</i> (two white paints), <i>Medium Cerussa</i> (name for one of the two white paints, see Linke 1894)	<i>Two different binders, the composition of which is unclear</i>	White pigments in two unknown vehicles, one of the latter is called ' <i>Medium-Anreibemittel</i> ' ('Binding Medium-Grinding Vehicle'), to be mixed in with 'Tempera colors' for pastose painting. The two white paints were launched later than the 'Tempera', 'Majolica' and 'Resin colors', but before the <i>Mediumfarben</i>
	Resin colors (sic)	<i>Harzfarben</i> , <i>Pereira-Harzfarben</i> , <i>Harzmedium-Farben</i> , <i>Firnisfarben</i>	Copaiba balsam, resins, essential oils and pigments	Must be combined with 'Tempera resin medium', 'Resin medium (No. 110)' or another compatible vehicle (i.e. binding medium)
	An emulsion tempera paint; no contemporary translation was found. (Literally translated: 'Binding Medium Paints' and 'Binding Medium Tempera Paints'.)	<i>Mediumfarben</i> , <i>Medium-Temperafarben</i>	Cherry gum, linseed oil, size, honey, pigments	A 'proper' paint: to be used without the addition of a vehicle
Intermediate layer	Tempera fixatif (sic) (No. 4)	<i>Fixativ</i> , <i>Pereira-Fixativ</i>	Copaiba balsam, mastic, dammar, turpentine, Venice turpentine, lavender oil	'Varnish' and 'Tempera fixatif (No. 4)' are very similar. Varnish is 'stronger' (contains more resin), 'Tempera fixatif (No. 4)' is 'weaker' (contains less resin). The difference in composition between matt and glossy varnish is likely to be reflected in the ratio of the materials used
Varnish	Varnish (Two varnishes, one matt, one glossy)	<i>Harzfirnis</i> , <i>Pereira-Firnis</i>	Copaiba balsam, mastic, dammar, turpentine, Venice turpentine, lavender oil	

Table 1 Pereira's products for easel painting and their binders.

White background: products launched in 1891. Main sources: Pereira 1891b, appendix, pp. 1–6; TMM 1892, pp. 29–33, 55–57; Pereira 1892e, pp. 4–9, 14; Pereira 1893a, pp. 9–16; Pereira 1909, pp. 62–76, 80–92. *Blue background:* products launched in the mid-1890s. Main sources: *Medium Cerussa*: Linke 1894; *Mediumweiss*: Schlichtegroll 1897, p. 53; *Mediumfarben*, *Medium-Temperafarben*: Berger 1907e, p. 4; Pereira 1909, p. 33; Linke 1910, p. 140; Eibner 1909, p. 266; TMM 1910a, p. 171.

corresponded to the 'neutral shadow and half shadow hues of the old Italian school' (Pereira 1891b, pp. 45–49; *TMM* 1892, p. 81; Schlichtegroll 1897, p. 40).² Both of these primings provided highly absorbent painting surfaces. In addition to canvas, artists' boards (cardboards and wooden panels) that were primed with Majolica preparation were also available.

For the painting process itself, Pereira developed a two-part system. There were three types of pigment-rich tube 'paints'; their names (spelled in the manner of the above-mentioned source) were 'Majolica colors', 'Tempera colors' and 'Resin colors'. These were not intended for use on their own. In order to obtain a well-bound paint they had to be blended with one of four separately packaged liquid vehicles that was compatible: 'Tempera mixing fluid (No. 1)', 'Tempera siccative (No. 2)', 'Tempera resin medium (No. 3)' and 'Resin medium (No. 110)'. Surprisingly, given the names Pereira had chosen for them, 'Tempera siccative (No. 2)' was not a siccative, but an aqueous vehicle, and 'Tempera resin medium (No. 3)' is unlikely to have contained resin (see Table 1). There was also a 'Tempera fixatif (*sic*) (No. 4)' and two 'Varnishes', one matt, the other glossy. The bracketed specification numbers are only given in the previously mentioned English-language pamphlet (Pereira 1892e, pp. 7, 8, 14, 16); they do not occur in its German equivalents.

The tube 'paints' contained only what Pereira called '*Anreibemittel*' ('grinding vehicles') along with the pigments rather than 'proper' binders. The 'grinding vehicles' used in the tube paints and the separate painting vehicles alike were based on sizes, gums or resins, but they also contained – in various combinations thereof – copaiba balsam, essential oils, honey, glycerine, phenol, vinegar and starch. The fixative and varnishes contained resins, balsams and essential oils (Table 1). Pereira claimed that none of his products contained fatty oils (Pereira 1893d, p. 305; Berger 1907d, p. 88), as he believed that these materials were responsible for the problems – darkening, cracking and other signs of degradation – that plagued traditional oil

paintings. His advertisements repeatedly stressed the fact that all of his products were completely free of this corrupting material and, consequently, that they were extremely durable.

In contrast to his binders and vehicles, which (as will be shown below) soon became the object of criticism, the high quality of Pereira's pigments³ was not disputed. Many users seem to have been favourably impressed by their tinting strength and fine grain and felt that their quality justified their slightly higher price as compared to other brands of industrially prepared temperas. Among Pereira's paint formulations were a few with proprietary pigment mixtures, such as the three greys mentioned above, and a white paint described as 'the true Cerussa of the old masters' (also spelled 'Cerusa' or 'Cérusa'). It contained either lead white or zinc white

En gros-Preisliste für die Dekorations-Malerei in 1 Kilo und grösserer Packung

Verzeichnis der Farben.	Preis per Kilo.	Verzeichnis der Farben.	Preis per Kilo.
Deck-Kremserweiss . . .	4.50	Terra Pozzuoli . . .	7.—
Cérusa	5.—	Caput mortuum . . .	7.—
Barytweiss	5.—	Umbra nat. cyprische .	5.—
Chromgelb, hell . . .	8.—	” gebrannt . . .	5.—
” dunkel . . .	8.—	Terra di Siena, gebr. .	5.—
” orange . . .	8.—	Grüne Erde, gebr. .	8.—
Cadmium, hell . . .	70.—	Casselerbraun . . .	20.—
” dunkel . . .	70.—	Brüsselerbraun . . .	30.—
Indischgelb	80.—	Cobaltblau, dunkel .	70.—
Gelber Ocker, hell . .	5.—	” hell . . .	45.—
Goldocker	5.—	Pariserblau	7.—
Terra di Siena, nat. hell .	5.—	Ultramarin, hell . .	8.—
Neapelgelb, hell . . .	7.—	” dunkel . . .	8.—
” dunkel . . .	7.20	Chromoxydgrün, ^{gelb} dunkel .	8.—
Barytgelb	7.75	Smaragdgrün	7.—
Carminlack	60.—	Grüne Erde	7.—
Krapplack, dunkel . . .	20.—	Veron. grüne Erde .	8.—
Österr. Zinober	15.—	Vert Paul Veronese .	12.—
Fleischocker	7.—	(Schweinfurtergrün)	
Gebr. Ocker, hell . . .	7.—	Elfenbeinschwarz . .	8.—
Venetianischrot	9.—	Rebenschwarz . . .	8.—
Englischrot, hell . . .	8.—		

inklusive Verpackung ab Stuttgart, netto Cassa.

FLÜSSIGKEITEN.

Siccative pr. Kilo M. 2.50. Kräftig bindendes Malmittel für Staffeleibilder, für Gobelín und Wandmalerei. Falls es dickflüssig wird, ist es im lauen Wasserbad etwas zu erwärmen.

Fig. 3 Pricelist for pigments (sold in kilogram units) and a vehicle ('siccative' [*sic*]) for decorative painting from a brochure on Pereira's tempera printed in 1893 (Pereira 1893a).

pigment combined with the common filler barium sulphate (Linke 1894), which Pereira – consistently and quite disingenuously – called '*Majolikaerde*' ('majolica earth'). Aniline pigments were excluded from his range (Schlichtegroll 1897, p. 33).

THE PAINTING PROCEDURE

The fact that Pereira's paints were not based on emulsion media clearly distinguished them from the majority of contemporary tempera paints. As we have seen, his system did involve the use of binders of both types – water-soluble and insoluble, mainly sizes and resins – but they were applied separately. The process he recommended for easel painting is shown in Table 3. It was divided into three stages: underpainting, execution and completion (Pereira 1891b, appendix pp. 10–12; Pereira 1892e, pp. 12–18; Schlichtegroll 1897, pp. 46–55). The first stage (underpainting) was to be performed *a fresco*. In a manner resembling that described in the 16th century by Armenini (quoted by Berger 1901, p. 54), the painting was to be soaked from behind with '*Tempera siccatif* (No. 2)' and water and kept wet until the underpainting was completed. While the binder used in this first stage (underpainting) was purely aqueous (mainly size), a small amount of resinous matter was introduced with a coat of Pereira's (resin-containing) '*Tempera fixatif* (No. 4)' (see Table 1), which was intended as the conclusion of the underpainting stage, and with more intermediate fixative coatings in the subsequent stage (execution). The final work phase (completion) called for the use of '*Resin colors*' in combination with the vehicles '*Tempera resin medium* (No. 3)' and '*Resin medium* (No. 110)'. The application of the final (also resinous) varnish must have been a difficult process, as the topmost resin-bound paint layers could again become soluble and smear as the substance was brushed out. Pereira referred to this problem indirectly in two of his pamphlets, where he recommended the application of a coat of '*Tempera mixing fluid* (No. 1)' (an aqueous vehicle, see Table 1) prior to varnishing, thus inferring that this was to be done in order to protect the resinous paint layers (Pereira 1892c, p. 17; Pereira 1892d, p. 16).

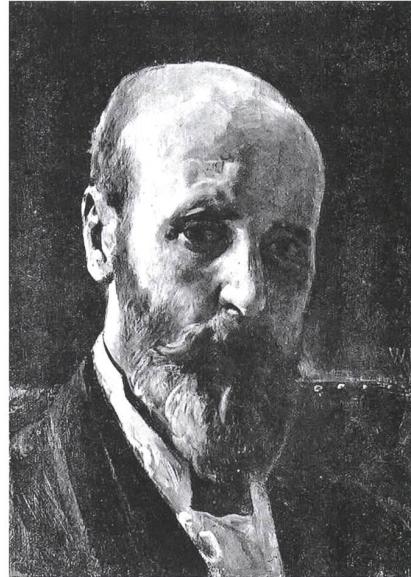


Fig. 4 Print captioned: *Bouguereau (1891). Portrait A. Pereira (on wood)*. After the painting by William-Adolphe Bouguereau, *Portrait of Alfonso von Pereira-Arnstein*, Pereira tempera on wood panel, 1891. (Reproduced from Pereira 1926, p. 16.)

Artists appreciated the luminosity of colour that they were able to achieve with Pereira's methods (Zechmeister 1890, p. 206; Wirth 1897, p. 5; Pereira 1909, pp. 96–151). In contrast, the inventor himself seemed to prize the durability of his system above all else. He claimed that it never formed wrinkles when drying, it remained elastic, it did not yellow, and that the cracks which formed with age were harmless and not associated with damaging flaking (Pereira 1891b, pp. 19–22; TMM 1892, pp. 32–33; Pereira 1909, pp. 55–58; Schlichtegroll 1897, pp. 20–26). He also boasted that it possessed a number of exceptionally practical features; for example, '*Majolica colors*' and '*Tempera colors*' did not dry on the palette, almost irrespective of the length of time that passed (a fact explained by their high content of glycerine and honey). However, once they were applied to the painting they 'dried' quite quickly, due to the fact that the absorbent grounds of the Pereira supports rapidly soaked up all of the non-drying components of the vehicle. Equally, areas painted in '*Majolica*' and '*Tempera colors*' could be easily wiped away in case corrections

FUNCTION	NAMES OF PRODUCTS AS USED BY PEREIRA IN HIS GERMAN TEXTS	BINDERS OF PRODUCTS AS MENTIONED IN SOURCES	REMARKS
Fixative for pastels (no contemporary translation was found)	<i>Pastellfixativ</i>	Size (i.e. animal skin glue)	
Vehicle for decorative painting (no contemporary translation was found)	<i>Dekorationsmalmittel</i>	Size (i.e. animal skin glue)	The vehicles 'Tempera siccative (No. 2)' and 'Tempera resin medium (No. 3)' (see Table 1) are also recommended for decorative painting

Table 2 Pereira's products for decorative painting and pastel, and their binders.

Main sources: Pereira 1893a, pricelist and p. 33; Schlichtegroll 1897, p. 59.

SUPPORT / GROUND	WETTING OUT	PAINTING A FRESCO	DRYING	PAINTING A SECCO	
				UNDERPAINTING	EXECUTION
Majolica canvas or Albumen canvas	Canvas and ground are wetted from behind with Tempera siccative (No. 2) and water	Paint(s): Majolica colors and/or Tempera colors	The painting is left to dry	Intermediate Layer: Tempera fixatif (No. 4)	Paint: Tempera colors
		Vehicle(s): Tempera mixing fluid (No. 1) and/or Tempera siccative (No. 2)		Vehicle(s): Tempera siccative (No. 2) and/or Tempera resin medium (No. 3)	Intermediate layers: Tempera fixatif (No. 4) and/or Varnish
Alternative: A ground prepared by the artist using Tempera siccative (No. 2)	Alternative: No wetting	Alternative vehicles: Casein, egg white	-	-	-

Table 3 Pereira's recommended procedures for easel painting.

Main sources: Pereira 1891b, appendix, pp. 10–12; Pereira 1892e, pp. 12–18; Schlichtegroll 1897, pp. 46–55. In Pereira 1909, this build-up is no longer described.

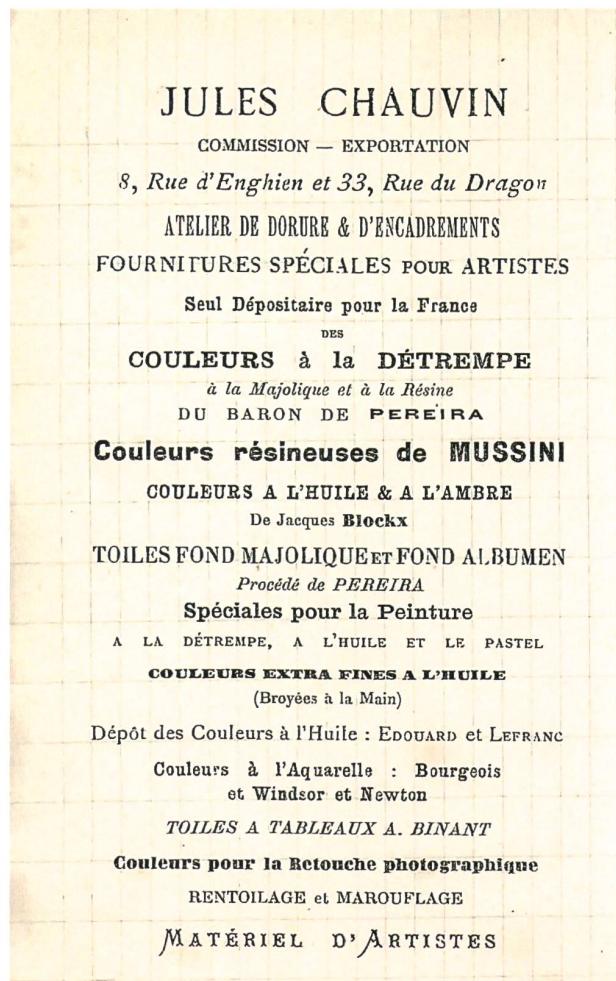
were desired, as long as they had not yet been covered by a coating of fixative. A severe disadvantage of the process was, however, the fact that the work underwent two changes of hue during the early stages of its creation, during which time the paint was still mainly bound in

size. This was due to alteration of the refractive index of the medium and therefore the saturation of the pigments: the colours lightened a few shades while drying and then, with the application of Pereira's fixative, they darkened again, became more transparent and

Fig. 5 Advertisement on stationery used by the Parisian colour merchant Jules Chauvin, 1894. The list of products Chauvin dealt with at that time included Pereira's products: 'COULEURS à la DÉTREMPE / à la Majolique et à la Résine / DU BARON DE PEREIRA / [...] / TOILES FONDS MAJOLIQUE ET FOND ALBUMEN / Procédé de PEREIRA / Spéciales pour la Peinture / A LA DÉTREMPE, A L'HUILE ET LE PASTEL'. (Tempera colours / of Majolica and of Resin / of Baron von Pereira / [...] / Canvases with Majolica and Albumen preparations / Method of Pereira / Especially for painting / in tempera, in oil and in pastel). Jules Chauvin from Paris to Cuno Amiet in Solothurn, 3 October 1894, Estate of Cuno Amiet, Oschwald (Switzerland).

VARNISH		
COMPLETION		
Paint: Resin colors	Intermediate Layer: Tempera mixing fluid (No. 1)	Varnish
Vehicle(s): Resin medium (No. 110) and/or Varnish, used as a vehicle		
—		
Alternatives: Tempera colors combined with Tempera siccatif (No. 2) and egg yolk, or oil resin paints, or oil paints (no particular brands are recommended)	—	—

sometimes blotchy, even on occasion necessitating retouching. For those artists who could not come to grips with the problem of the dual change of hue or with the rather complicated procedure as a whole – or who as a matter of principle preferred to work with other binders than those contained in Pereira's vehicles – there was an alternative. They were informed by Pereira that the use



of his products was not strictly limited to his suggested procedure and layering system. Also, he noted, his vehicles could be combined with or changed for other substances, such as egg white, egg yolk (Pereira 1891b, pp. 44, appendix pp. 12–13; *TMM* 1892, p. 80; *TMM* 1910a, p. 168), or a casein solution (Pereira 1909, p. 53). In the completion stage, his 'Resin colors' could even be replaced by common oil paints (Pereira 1891b, p. 51; *TMM* 1892, p. 82; Schlichtegroll 1897, pp. 57–58).

As represented in Table 2, some of the products Pereira developed for easel painting could also be used for decorative and mural painting (in particular, he

Einige Fabrik der patentierten Pereira'schen Tempera etc. Farben, Malmittel,
Leinwanden u. s. w.

J. G. MÜLLER & Co.

Stuttgart,

Kanzleistrasse 26.



D. R. P. Nr. 54511 65057. 65274.

Zeugnisse:

Wir sind überzeugt, dass von dem v. Pereira'schen Tempera-Verfahren eine bedeutende Förderung und neue Entwicklung der Kunst zu erwarten ist.
Pereira's Temperafarben und die dazu gehörigen Malmittel, Leinwanden u. s. w. sind das beste Material, welches überhaupt existiert.

München, Ende Dezember 1892.

gez. Professor Franz v. Lenbach.
" Rudolf Seitz.
" Franz Stuck.

Pereira's Temperatechnik eröffnet für den Aquarellmaler ein noch vollkommenes offenes und bisher unbekanntes Feld neuer Technik und scheint speziell in der Entwicklung der Aquarellmalerei dazu berufen, ein bedeutendes hervorragendes Moment zu bilden.

München, Januar 1892.

gez. Hans von Bartels.

Je suis heureux de vous exprimer toute ma satisfaction pour l'emploi de votre procédé de peinture à tempéra.
Le procédé est d'autant plus intéressant, qu'il peut recevoir beaucoup d'applications différentes et se plier à la fantaisie ou aux habitudes de chaque artiste: c'est même ce qui fait, à mon avis, le charme de la peinture à la détrempe. . . .

Paris, Janvier 1893.

Edouard Dantan

s. Membre de l'Institut France.

La peinture à tempéra de Mr. le baron de Pereira est, suivant moi, la seule à employer dans les grands travaux, c'est certainement avec cette peinture que les toiles des maîtres ont été exécutées et ont pu garder leur éclat et leur solidité.

Paris, Janvier 1893.

s. Poilpot.

.... Ihre Leinwand ist die beste mir bekannte für Ölmalerei, da sie das Öl anzieht und daher die Farbe nicht abspringen kann, was bei allen anderen Leinwänden, selbst bei denen mit Kreidegrund, der Fall ist, weil der Grund zu stark geölt ist und deshalb das Öl nicht einzieht.

Kopenhagen, März 1893.

W. Xylander.

Vertreter für die Vereinigten Staaten von Nordamerika werden gesucht.

recommended the use of 'Majolica colors' with 'Tempera siccata' (No. 2) or 'Tempera resin medium' (No. 3) for decorative painting), as well as in place of watercolours and in order to achieve pastel-like effects (which could be obtained by using 'Majolica colors' or 'Tempera colors' with pure water). Some products were especially designed for use in schools (Fig. 8), or for purposes other than easel painting. For decorative painting, Pereira sold powdered pigments (Pereira 1893a; see also Fig. 3) as well as a corresponding, separate vehicle (Schlichtegroll 1897, p. 59), and his range also included a 'Fixatif for pastels' (Pereira 1893a, pp. 32, 33).

PROMOTION AND INITIAL SUCCESS

Pereira opted for a clever, albeit not unusual, approach for the promotion of his products and painting system.

Fig. 6 Advertisement by the Stuttgart-based manufacturer of Pereira's products, J.G. Müller & Co. Pereira constantly strove to expand his market. The last line of the advertisement reads: 'Sales representatives for the United States of North America wanted'. (Reproduced from TMM 10(171), 1893, p. 439.)



Fig. 7 Advertisement by J.G. Müller & Co.: 'Best existing tempera paints. Best alternative to painting in oil. Best water colours. Unsurpassed canvas preparations for [painting in] tempera or oil.' (Reproduced from *TMM* 13(2), 1897, p. 8.)

Antoine-Nicolas Louis Bailly (1810–1892), the president of the Société des Artistes Français. As the Société was interested in all new developments in the area of painting technique – it had recently founded a committee charged to devise a course of action in order to bring about the general improvement of artists' paints (Keim 1891, p. 43) – Bailly called a meeting specifically dedicated to Pereira's invention (Pereira 1891b, pp. 54–55). A number of French and German newspapers even reported on the event and Pereira published English translations of their reports only a few months later (Pereira 1892g). The article printed on 14 August 1891 in *Münchener Neueste Nachrichten* for example, said of the meeting: ' [...] Here Baron de Pereira had an opportunity to conduct his own case before a phalanx of the first French painters [...]! It then listed some of the better known members present in the audience: Paul DuBois, Tony Robert-Fleury (1837–1911), William Adolphe Bouguereau (1825–1905), Léon Bonnat (1833–1922), Jules

Lefebvre (1836–1911), Henri Zuber (1844–1909), Gabriel Ferrier (1847–1914), Jean Baptiste Edouard Detaille (1848–1912), Victor Gilbert (1947–1933), Jehan-Georges Vibert (1840–1902), Edmond Yon (1841–1897), Gaston Casimir Saint-Pierre (1833–1916), Emile Renard (1850–1930), Albert Pierre Dawant (1852–1923) and many others. 'To all of them the baron had sent a copy of his notes', the (translated) account continued, 'and he also was enabled to lay before them several specimens which Messrs. Bouguereau and Tony Robert-Fleury had produced [...]. Of the greatest interest however to the French artists were two small sketches by Franz von Lenbach which the baron had brought with him' (Pereira 1892g, p. 6). During the remaining days of Pereira's Paris visit more meetings and practical trial sessions were arranged with other artists, who were not members of the Société des Artistes Français, including Pierre Puvis de Chavannes (1824–1898), Eugène Carrière (1849–1906), Paul Albert Besnard (1849–1924), Pascale-Adolphe Dagnan-Bouveret (1852–1929), Carolus-Duran (1837–1917) and Edouard Charlemont (1848–1906) (Pereira 1892g, pp. 6–7). Pereira took possession of many or all of the trial works created in these meetings; back in Stuttgart, he exploited them, as well as his network within the local government, to form a substantial part of his advertising campaign. 'The Württemberg government has placed an atelier at Baron Pereira's disposal which is situated within the buildings of the Royal Academy of Arts at Stuttgart', the newspaper account continued. 'Here he will always be glad to receive visitors and show them the sketches of the Paris artists' (Pereira 1892g, p. 9).

Pereira returned to the French capital in February 1892 and this time, he invited members of both the Société des Artistes Français and the Société Nationale des Beaux-Arts to the Austro-Hungarian embassy (no doubt available to him thanks to his connections within the sphere of diplomacy) for more lectures on his technique. His efforts of the previous year had proved successful: the Parisian colour merchant Jules Chauvin had begun to trade his products (Fig. 5), as evidenced by an advertisement in the front section of one of Pereira's French pamphlets (Pereira 1892c), and some art teachers had

recommended them to their students (Pereira 1909, p. 103).⁵ Likewise, in Munich, Pereira's influence was steadily growing. Three of the city's most successful and influential artists, Franz von Lenbach (1836–1904), Franz von Stuck (1863–1928) and Rudolf Seitz (1842–1910) – the latter a professor at the Munich Art Academy – joined forces to compose an enthusiastic statement declaring that 'a momentous advancement and new development' (*eine bedeutsame Förderung und Entwicklung*) was sure to happen in the arts thanks to Pereira's procedure (Pereira 1909, p. 102); their praise was subsequently widely quoted in advertisements for Pereira's products (Fig. 6).

In the early years, Pereira promoted his products with great diligence and efficiency. He placed articles in the influential Munich-based journal *Technische Mitteilungen für Malerei* (*Technical Communications on Painting*, abbreviated herein to *TMM*) and printed pamphlets in German, French, English and Italian (Pereira 1892a; Pereira 1892b; Pereira 1892c; Pereira 1892d; Pereira 1892e; Pereira 1892f; Pereira 1892g). As Kinseher has recently pointed out, in 1893 he took full advantage of the World's Fair in Chicago. Not only was his full product range exhibited at the fair, so too was a conspicuous example of what could be achieved with it: the ceiling painting of the German art section had been executed entirely in Pereira's products by von Lenbach, an internationally renowned artist at the time (Pereira 1893d, p. 307; Kinseher 2014, pp. 68–69).

During the same period Pereira and his manufacturer, Müller, advertised in the catalogues of the two concurrent exhibitions in the Munich Glaspalast: an exhibition on painting technology (*Ausstellung für Maltechnik*, referred to herein as the *Maltechnik Exhibition*), organised by the Deutsche Gesellschaft zur Beförderung rationeller Malverfahren (German Society for the Promotion of Rational Painting Methods, abbreviated herein to the German Society for PRPM), and the *Grosse Münchner Kunstaustellung* (*Large Munich Art Exhibition*). He also began to approach teaching institutions and individual artists all over Europe by sending them

his pamphlets accompanied by product samples. He begged those who already employed his paints to ensure that this was mentioned as their chosen technique when their works were shown in exhibitions. He requested commentary and testimonies, and only published those that were favourable. As shown in detail in Table 4 (pp. 102–116), such testimonies originated primarily from Germany and France, but he also received others from Austria, Hungary, Switzerland, Italy, Poland, Belgium, the Netherlands, Denmark, Finland and the United States (Pereira 1909, pp. 96–151).

As Pereira's procedure was rather complicated, practical instructions were an important aspect of his crusade for popularity. In 1892 and 1893 he continued to give lectures and demonstrations in museums and art academies in Berlin, Munich, Stuttgart, Milan, Turin and Venice (Pereira 1909, p. 19), and he published his lecture script twice (Pereira 1893c; Pereira 1893d). From 1894 onwards, this lecturing role was taken over by a friend, the German poet and painter Carl Felix von Schlichtegroll (1862–1946), who had become a specialist in Pereira's technique. He founded a school for painting in Berlin explicitly dedicated to its teaching, gave classes at German and Italian art academies and eventually even published a booklet (Schlichtegroll 1897). Among the diverse possibilities of working in Pereira's tempera described in this booklet, Schlichtegroll mentions the employment of grisaille under-painting followed by the application of glazing in colour, an innovative development of the procedures detailed in Pereira's own texts (Schlichtegroll 1897, pp. 46–49).

Around 1900 it was a common belief among artists that paint manufacturers and dealers often adulterated their products; when lecturing to artists Pereira liked to hint that he shared this view. In his talks he accused dealers of 'corruption' while portraying himself as a fellow artist and someone whose involvement in paint manufacturing was motivated by noble and idealistic goals rather than crass commercial concerns (Pereira 1892g, pp. 7, 14). The French newspaper *Le Gaulois*, for example, reported on Pereira's first Paris lecture: 'Baron de Pereira is [...] offering his secret to artists to the exclusion of color

dealers. Being [an] artist himself, he has practically tried his invention [...]. Color dealers will be furious' (Pereira 1892g, p. 14). Pereira often began the titles of his publications and pamphlets issued in various languages with the phrase 'A word to artists' (*An die Künstler*, *Ai pittori* or *'Encore un mot aux artistes'*) – in so doing, he ostentatiously excluded paint makers and dealers from the group to whom he spoke.

FIRST CRITICAL VOICES

The antipathy that Pereira felt for other paint manufacturers was clearly mutual. In the summer of 1893 the mural painter and paint maker August Wilhelm König of Berlin and the chemist and pharmacist Ernst Friedlein of Würzburg – both of whom had developed emulsion tempera paints – published contributions in the journal *TMM* where they mocked the many ambiguities and contradictions present in Pereira's printed texts as well as his apparent lack of technical knowledge (König 1893, pp. 286–287; Friedlein 1893b). It was probably in a spirit of revenge that, in September of the same year, at a congress on painting technique (*Maltechnik Congress*, see also the contribution by Kinseher, in this volume) organised in Munich by the German Society for PRPM, Pereira attempted to prevent the inclusion of paint manufacturers in a committee the society had recently charged with the testing of the quality of artists' materials (Kongress 1893, pp. 523–524).⁶

More criticism of Pereira's tempera system was expressed in the same year in the context of the above-mentioned *Maltechnik Exhibition*. In the show, technical issues were addressed, in the context of both historical and modern paintings, paints and other artists' materials. Exhibits were chosen to demonstrate success as well as failure. In spite of a severe shortage of space, Pereira's technique was amply represented with 30 odd works by a number of artists, most of them submitted by Pereira and one even created by him. Among the few examples submitted by others there were, however, some that were meant to illustrate the defects of his procedures. Two such

works were described as having faded (Munich 1893, p. 91), and another had been painted in thick impasto, which was cracking and flaking at the time of exhibition. To the amusement of the public, the paint of two other thickly painted works began to 'weep' when wet weather arrived after a long period of heat (Munich 1893, pp. 57–58; *TMM* 1910a, pp. 173–175). Pereira wrote furious letters to the exhibition's organising committee and to newspapers protesting against the inclusion of these works and accusing the committee of dishonest motives. He claimed that the failures were not due to his products, but to mistakes made in their use by the authors of the works (Kongress 1893, p. 475). To be fair, at least some of the flaws were indeed likely to have been a result of improper use of Pereira's system: the author of one of the cracked works had attempted to paint with the (incompatible) combination of Pereira's 'Tempera colors' (soluble in water) and his 'Varnish' (soluble in turpentine) (*TMM* 1910b, p. 192). As to the weeping, it is possible that the thickly applied 'Majolica' or 'Tempera colors' had been used without the addition of a vehicle (which was indispensable for creating a well-bound paint for use in impasto painting) and that the honey present in the underbound paint layer had absorbed water from the increasingly humid air, thereby resulting in exudations (Borucki 1894, p. 129).

A year later in 1894, *TMM* printed two more articles criticising Pereira's products, both written by chemists. The Austrian Friedrich Linke (1851–1914), professor of colour chemistry and painting technique at the Academy of Fine Arts as well as at the School of Arts and Crafts in Vienna, expressed his anger concerning Pereira's habit of employing misleading labelling to describe his products. He cited examples such as Pereira's use of the appellation 'fine majolica earth' for the plain barium sulphate filler, 'true cerussa of the old masters' for the common mixture of lead white and barium sulphate, and 'poison-free medium cerussa' for a new product in his range, which in spite of its name (cerussa is Latin for lead white) did not even contain lead white (Linke 1894). A little later, Leon Borucki, assistant at the Versuchsanstalt für Maltechnik (Research Institute for Painting

Technology) in Munich-Grünwald, deplored the problem of the dual change of hue and criticised Pereira's tube paints for a lack of binding power, poor drying properties, susceptibility to mould growth and weak adhesion when used on canvas supports (Borucki 1894, pp. 127–133).⁷ Both Linke and Borucki pointed out the risk associated with the use of vinegar as found in Pereira's aqueous vehicles, as vinegar is known to have a destructive effect on pigments including lead white, zinc white and ultramarine (Linke 1894, p. 74; Borucki 1894, pp. 130, 131; Linke 1910, pp. 138–139; *TMM* 1910a, pp. 173–175).

As has been suggested, it is very likely that the testimonies Pereira received from artists were not always positive and that he did not publish the critical ones. Nevertheless, evidence of artists' negative opinions has been found. A letter from the Munich-based painter Karl von Pidoll (1847–1901), for example, dated February 1894, to the artist Hans Sandreuter (1850–1901) in Basel proves that he and Sandreuter (both enthusiastic tempera painters) agreed that Pereira's system was a 'con'. 'Pereira is a complete dilettante and wants to make money', Pidoll scolded, '[I've heard that] the whole thing is already beginning to fail completely'.¹⁸

CONTINUING SUCCESS

Whether the sales figures of Müller & Co., manufacturer of Pereira's products, suffered from the negative evaluations published in *TMM* in 1894 is unknown. It is clear, however, that Pereira continued with his publicity campaign. There is evidence that his paints and vehicles continued to be recommended by various artists and entities in the ensuing years, for example in a German magazine for arts and crafts and in a German decorative painters' almanac (Pereira 1909, pp. 112–114), and that he continued to advertise them in *TMM* up until June 1897. An impressive piece of evidence attesting to the reputation as a tempera scholar that Pereira had managed to create for himself can be found in the 15th volume of the renowned German Brockhaus



Fig. 8 Advertisement by the company Kaspar und Dr. Vogl, Vienna, where Pereira's products were manufactured from c. 1908. It is the only known mention in the literature of a Pereira product made especially for schools ('Schul-Temperafarben'). (Reproduced from Pereira 1909, unnumbered page at the end.)

encyclopedia, printed in 1895. Under the entry for 'tempera', Pereira's name is mentioned along with some aspects of his claims about the tempera of the Old Masters, his products and even their manufacturer (Brockhaus 1895, pp. 692–693).⁹

'MEDIUMWEISS' AND 'MEDIUM TEMPERAFARBEN'

As indicated in Table 1, a white paint called 'Medium-cerussa' ('Binding Medium Lead White') is first

mentioned in the literature as part of Pereira's product range in 1894 (Linke 1894). It was one of two types of white paint that Pereira developed in the early or mid-1890s which he called '*Mediumweiss*' ('Binding Medium White'), because compared to his other paints they contained more binding medium. Their binder was referred to, in Pereira's confused terminology, as '*Medium-Anreibemittel*' ('Binding Medium-Grinding Vehicle'). A specification of the binder's composition was not found in the sources. The two *Mediumweiss* paints were to be employed as admixtures to 'Tempera colors' for pastose painting: as they increased the opacity of the tempera paint, the degree of the dual change of hue – which would otherwise become yet more pronounced with the increased thickness of the tempera paint layer – was reduced (Schlichtegroll 1897, p. 53).

In 1897 or slightly earlier, Pereira launched a new type of paint, '*Medium Temperafarben*' ('Binding Medium Tempera Paints'), that probably contained a very similar, if not identical, medium as the two *Mediumweiss* products (Table 1). '*Medium Temperafarben*' were first mentioned in a testimonial of 1897 by the German artist Hans Thoma (1893–1924) (Pereira 1909, p. 118). They differed from the tube paints launched in 1891 in two significant aspects: as they contained a greater quantity of binding medium, they could be used as they were, or thinned with water alone. No separate vehicle had to be added,¹⁰ even for impasto applications, and they retained their hue as they dried or were coated in Pereira's fixative (Pereira 1909, pp. 73–74). There is some evidence that this new product won back some of the formerly disenchanted customers. Thoma for example, who had been annoyed by the difficulties of painting in (any type of) tempera, wrote to his pupil Maria La Roche (1870–1952) in October 1898: 'When you buy tempera paints from Müller in Stuttgart, tell them explicitly that you want the improved ones [...]. They differ a lot from the previous Pereira paints, which changed their hue when drying and had to be varnished and treated with fixative over and over again' (Busse 1942, p. 220). In a similar vein, the Swiss artist Cuno Amiet (1868–1961), who earlier had been dissatisfied with Pereira's tempera paints,

wrote to his friend Giovanni Giacometti (1868–1933) in 1902 that he was now using Pereira's *Medium Temperafarben* and was satisfied with them (Radlach 2000, p. 338). The reason for the improvement lay in a newly introduced secret ingredient: '*Mediumfarben*' contained linseed oil (Berger 1907e, p. 4; Eibner 1909, p. 266; TMM 1910a, p. 171). As this was the very substance that Pereira had always taken great pains to condemn, he now preferred not to mention its presence in his latest, probably most successful, product.

It is likely that Pereira ceased to promote the procedure involving *a fresco* and *a secco* stages when he launched his *Mediumfarben*. This system, which today seems far too complicated to ever have become very popular, was no longer mentioned in his otherwise extensive publication of 1909. It is also possible that he ceased to produce the 'Majolica colors', which he had recommended up to the mid-1890s for underpainting and decorative painting, when the *Mediumfarben* were introduced, as they too ceased to be mentioned in the sources. 'Tempera colors' however, continued to be produced and were now recommended for underpainting (Pereira 1909, pp. 62, 93–95).

TEMPERA REDIVIVA! AND MORE CRITICISM

In 1904, Pereira's fellow countryman Friedrich Linke published a manual entitled *Die Malerfarben, Mal- und Bindemittel und ihre Verwendung in der Maltechnik* (Artists' Paints, Vehicles and Binders and their Employment in Painting), which was soon used as a teaching aid in art academies in the German-speaking regions of Europe and became so sought after that new editions were printed in 1908 and 1913. To Pereira's distress, Linke's book included criticism of his temperas, disparagingly speaking of a 'mass of heterogeneous compounds in the binder' and repeating his earlier condemnation of the vinegar contained in the two aqueous vehicles (Linke 1894, p. 74; Linke 1904, pp. 118–119; Linke 1910, pp. 138–139).

In February 1907 Pereira, now aged 62 and retired from his office as head of the Stuttgart mission,

returned to Vienna where he sought to revenge himself against his fellow countryman, whom by now he must have considered as an arch enemy, and filed a complaint against Linke's criticisms at the Austrian Ministry of Culture and Education. As a result of his complaint the steering committee of the Chemical-Technical Department of the Office for Teaching Aids commissioned Ernst Beutel, professor of chemistry and head of the Chemical-Technical Laboratory of the Austrian Ministry for Labour, to examine the manufacturing process of Pereira's tempera and report his findings. Beutel travelled to Stuttgart in 1908, inspected the process and produced the requested report, which was handed over to a circle of insiders including Pereira himself (Pereira 1909, pp. VII–VIII; Linke 1910, pp. 135–136).

In 1909 Pereira published another book using the triumphant title *An die Künstler. Tempera rediviva! (To the Artists: Tempera Revived!)* (Pereira 1909), which was basically an extended new edition of the texts he had already published in 1891, but also included excerpts from Beutel's report. The excerpts left no doubt that the report had been perfectly favourable and that Linke was therefore in the wrong. In the preface, Pereira stated: 'It appears that Professor Linke has never seen my paints let alone examined them; because otherwise he would know that they neither contain, nor ever contained, any trace of vinegar' (Pereira 1909, p. VIII).¹¹

The reactions to this new book were ferocious. Again, the journal *TMM* provided the stage for the ensuing battle: firstly, Friedrich Linke explained to the journal's readership that, while Pereira's tube paints were possibly free of vinegar, this substance was definitely part of his aqueous vehicles (Linke 1910, pp. 138–139). He also used the opportunity to publicly accuse Pereira of persistently failing to inform his customers about the oil content of his *Mediumfarben* while continuing to rail against the inclusion of oil in artists' paints (Linke 1910, p. 140). Secondly, Ernst Beutel protested that the report he had written for the Ministry of Culture and Education in Vienna was by no means free of criticism, but that

Pereira had falsified his intent by quoting selected passages out of context, by systematic inversions and insertions, exchange of specific words and omission of all passages that were not in favour of his products (*TMM* 1910a, pp. 153–154, 176). Thirdly, Ernst Täuber, professor of chemistry at the Royal Prussian Academy of Fine Arts in Berlin, reported that a well-known painting frequently referred to in Pereira's advertising had in reality aged badly and lost its luminance many years earlier (*TMM* 1910a, pp. 177–178). Finally, Adolph Keim, editor of *TMM* and determined opponent of all tempera paints (see the contribution by Kinseher, in this volume), did his best to support the airing of disparaging views by printing criticisms in full and by publishing a detailed comparison between Beutel's report and Pereira's falsified version (Beutel 1910, pp. 189–191). In a vain attempt to defend himself, Pereira sent a letter to the editor, to which Beutel wrote a very angry reply (*TMM* 1910b). From then on Pereira remained quiet.

Early in 1909 Pereira had moved the manufacture of his products from Stuttgart to Vienna where the company Kaspar und Dr. Vogl¹² had taken over their production (Fig. 8) (see also the contribution by Travaglio, in this volume, Fig. 4). Pereira's tempera was mentioned a few more times in the specialist literature of the ensuing years, although much less frequently than before (Eibner 1909, pp. 261, 266, 444; Wenzel 1912, p. 62; Linke and Adam 1913, pp. 118, 119; Eibner 1928, p. 85). An advertisement by the Viennese manufacturer, now called Kaspar & Co., in an issue of *TMM* of April 1939, shows that production of Pereira's *Mediumfarben* continued at least until the outbreak of the Second World War. It is the last indication of the existence of a Pereira product on the market that could be found in the context of this research (*TMM* 1939).

CONCLUSION

Judging from the number of testimonials that reached Pereira (Table 4, pp. 102–116), it may be assumed that at least some of his products were appreciated by a fair

number of users despite the harsh criticisms they received from others. It is likely, however, that many of the favourable comments referred specifically to Pereira's tube paints, not to his vehicles. 'Majolica colors', 'Tempera colors' and 'Resin colors' contained so little binder that their contents could easily be combined with other types of media. Also, the elaborate system of building up layers as set out by Pereira and recommended in the 1890s, was not necessarily employed by users of his products – indeed his procedure may have been far too laborious and unappealing to artists of the avant-garde, who tended to favour spontaneity. It is quite likely that Pereira ceased to recommend this procedure after launching the *Mediumfarben*.

Today, it is not easy to locate paintings executed in Pereira's temperas. In 1926 Pereira's eldest son, Ludwig, published a booklet containing photographs of a selection of the paintings and sketches that had been created with his father's products during the practical trial sessions in 1891 and 1892, then in the collection of his family (Pereira 1926).¹³ A technical examination of those works would certainly be of interest. A landscape by Otto Modersohn (1865–1943), in which the sky area was probably created with Pereira's *Mediumfarben*, has been studied with optical methods, but it has not been subjected to material analysis (Kruppa 2011, pp. 49, 85). To my knowledge, only one work created with Pereira's paints has undergone material analysis: a small painting executed with *Mediumfarben* by Cuno Amiet in 1903 (Beltinger *et al.* 2015, pp. 57, 70, 71).

The investigation of the extent and manner of the use of the Pereira tempera system has only just begun. Just as there are doubtless many works created in this technique yet to be discovered and examined, there are certainly also more archival sources in artists' estates that bear witness to the different manners of employment of Pereira's products.

Table 4 References for the use of Pereira's products by individual artists.

COUNTRY OF ARTIST'S RESIDENCE AT TIME OF REFERENCE(S)	NAME OF ARTIST (CITY OF RESIDENCE AT TIME OF REFERENCE(S))	BIOGRAPHICAL DATA	REFERENCES
America	Blum, Rob[ert] (New York)	1857–1903	1894: Uses Pereira's 'Tempera colors'; purpose not specified (Pereira 1909, pp. 108–109)
Austria	Millet, J. D. (New York)	not found	1894: Uses Pereira's materials (he does not specify which materials) for tempera painting (Pereira 1909, pp. 109–110)
	Bamberger, Gustav (Zehenthof, Scheibbs)	1861–1936	1902: Employs Pereira's 'Tempera colors' for mural painting (Pereira 1909, p. 129)
	Charlemont, Hugo (Vienna)	1850–1939	1899: Plans to test Pereira's paints ('Farben'), because they were recommended to him by his brother Eduard Charlemont (France) (Pereira 1909, p. 124)
	Delug, Alois (Vienna)	1859–1930	1909: Named among the artists who supported Pereira's 'battle' for many years (Pereira 1909, p. XI)
	Gugg, Hugo (Saaleck)	1878–1956	1905: Uses Pereira's <i>Mediumfarben</i> and canvases ('Leinwanden') (Pereira 1909, p. 147)
	Kühn, Heinrich (Innsbruck)	1866–1944	1897 and 1898: A photographer; uses Pereira's tempera paints ('Pereirasche Temperafarben') for making gum prints ('direkter Pigmentdruck'; a photographic procedure, see the contribution by Pohlmann, in this volume) (Pereira 1909, pp. 118, 121)
	Lebiedzky, Eduard (Vienna)	1862–1915	1892: Orders 'Majolica colors' for the execution of decorative paintings on canvas that he intends to look like frescoes (Pereira 1909, pp. 99–100). 1898: Uses Pereira's paints and canvases ('Farben und Leinwanden') (Pereira 1909, pp. 120–121)
	Schram, [Alois] Hans (Vienna)	1864–1919	1909: Named among the artists who supported Pereira's 'battle' for many years (Pereira 1909, p. XI)
	von Angeli, Heinrich (Vienna)	1840–1925	1892 (or before): Makes an enthusiastic statement regarding Pereira's tempera ('détrempe') (Pereira 1892c, p. 24)
	von Merveldt, Paul; Graf (Bregenz)	1871–1929	1894: Uses Pereira's tempera paints ('Temperafarben') in combination with oil paints (Pereira 1909, p. 111)
	Wagner, A[dolf], (Graz)	1844–1918	1894: Employs Pereira's paints ('Farben') for watercolour painting (Pereira 1909, pp. 111–112). 1904: Ditto, for architectural views (Pereira 1909, p. 138)
Belgium	de Vriendt, Juliaan	1842–1935	1896: Uses Pereira's canvases ('toiles') and paints ('couleurs') (Pereira 1909, p. 114)

COUNTRY OF ARTIST'S RESIDENCE AT TIME OF REFERENCE(S)	NAME OF ARTIST (CITY OF RESIDENCE AT TIME OF REFERENCE[S])	BIOGRAPHICAL DATA	REFERENCES
Belgium	Keuler, Vital (Brussels)	not found	1906: Mention of Pereira's paints ('couleurs'); purpose not specified (Pereira 1909, p. 150)
	Robinson, Alexander (Bruges; Volendam)	1876–1952	1906: Mention of Pereira's paints ('colors') on paper and canvas (Pereira 1909, pp. 149–150)
Denmark	Xylander, W[ilhelm] (Copenhagen)	1840–1913	1893: Uses 'Majolica canvas' for large formats (he paints in oil, not tempera) (Pereira 1909, p. 106)
France	Aubertin, J. Francis (Paris)	not found	1906: Is extremely pleased with Pereira's paints ('couleurs'); purpose not specified (Pereira 1909, pp. 148–149)
	Besnard, Paul Albert (Paris)	1849–1924	1891: Participates in one of Pereira's Paris trial sessions (Pereira 1892g, p. 8). 1893: Exhibits a painting in Pereira's tempera paint (Munich 1893, p. 70). 1893: Pereira names B. among 'the many French and Italian artists that prefer his tempera to all other brands of water colours' (Pereira 1893d, p. 306)
	Bouguereau, William Adolphe (Paris)	1825–1905	1891: Participates in one of Pereira's Paris trial sessions (Pereira 1892g, pp. 7, 8). 1891: During this session, B. creates a portrait of Pereira himself in Pereira's tempera (Pereira 1926, p. 16; see also Fig. 4 in this contribution)
	Charlemont, Eduard (Montford)	1848–1906	1891: Creates a sketch in Pereira's tempera during a Paris trial session (Pereira 1926, p. 8). 1909: Named among the artists who supported Pereira's 'battle' for many years (Pereira 1909, p. XII)
	Detaille, Jean Baptiste Edouard (Paris)	1848–1912	1891: Participates in one of Pereira's Paris trial sessions (Pereira 1892g, p. 8). 1891: During this session, he starts a painting on panel in 'Pereira tempera' that remains unfinished (Pereira 1926, p. 11). 1893: Likes the procedure ('votre procédé de peinture à tempéra') (Pereira 1893a, p. 5; Pereira 1909, p. 103). 1893: Pereira names D. among 'the many French and Italian artists that prefer his tempera to all other brands of water colours' (Pereira 1893d, p. 306). 1909: Named among the artists who supported Pereira's 'battle' for many years (Pereira 1909, p. XI)
	Douillard, A[lexis] (Paris)	1835–1905	1893: Thinks that Pereira's procedure ('procédé') is an important step forward. In D.'s view the best binder for the new procedure is egg (Pereira 1909, p. 103)
	DuBois, Paul (Paris)	1829–1905	1893: Likes Pereira's 'tempera procedures' ('les procédés de peinture à la détrempe') (Pereira 1893a, p. 5; Pereira 1909, p. 103)

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France	Carolus-Duran [Durand, Charles Émile Auguste] (Paris)	1837–1917	1891: Participates in one of Pereira's Paris trial sessions (Pereira 1892g, p. 8; Pereira 1909, p. 18)
	Ferrier, Gabriel (Paris)	1847–1914	1891: Paints 'an angel floating in the air' in Pereira's tempera during one of Pereira's Paris trial sessions (Pereira 1892g, p. 8). 1893: Very satisfied with the procedure ('procédé'); has recommended it to his students (Pereira 1893a, p. 5; Pereira 1909, p. 103)
	Gintrac-Jouasset, [Jean] (Caudéran)	not found	1896: Uses Pereira's system ('système du Baron Pereira') (Pereira 1909, pp. 115–116)
	Leschhorn, P[aul] (Strasbourg)	1876–1951	1904: Employs <i>Mediumfarben</i> in combination with other brands of paint for watercolour painting (Pereira 1909, pp. 135–136)
	Morisset, André (Paris)	not found	1901: Employs Pereira's tempera paints ('vos couleurs à la détrempe') for large paintings, but finds them very expensive (Pereira 1909, pp. 127–128)
	Packeny, Laura (Moret-sur-Loing)	not found	1897: Has used 'Tempera colors'; purpose not specified (Pereira 1909, p. 117)
	Pissarro, Camille (Paris)	1830–1903	1891: Creates a landscape on canvas in Pereira's tempera during a Paris trial session (Pereira 1926, p. 15)
	Poilpot (<i>not identified</i>)		1893: Uses Pereira's tempera painting technique ('peinture à tempera') for large paintings (Pereira 1893a, p. 31; Pereira 1909, p. 103)
	Puvis de Chavannes, P[ierre] (Paris)	1824–1898	1893: Finds the procedure ('procédé') interesting (Pereira 1909, p. 102)
	Robert-Fleury, Tony (Paris)	1837–1911	1891: Paints 'a female figure' in Pereira's tempera during one of Pereira's Paris trial sessions (Pereira 1892g, p. 8)
France	Roux Rybaire, Eugène (Paris)	not found	1892: Uses Pereira's paints ('couleurs') only for underpainting, but states that he wants to learn to paint entirely in tempera ('détrempe') (Pereira 1892g, p. 25; Pereira 1909, p. 98)
	Steinlen, Théophile-Alexandre (Paris)	1859–1923	1901: Has been using Pereira's paints and vehicles ('les couleurs et les liquides') for years (Pereira 1909, p. 127)
	Thaulow, Frits (lives in Paris, writes from Venice)	1847–1900	1899: Often uses Pereira's procedure ('procédé Pereira') (Pereira 1909, p. 124)
France	Wengel, Jules (Paris)	1865–1934	1896: Employs Pereira's paints ('Farben'); purpose not specified (Pereira 1909, p. 115)

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France	Whistler, James Abbott McNeill (probably Paris)	1834–1903	1909: Named among the artists who supported Pereira's 'battle' for many years (Pereira 1909, p. XII)
	Yon, Edmond (Paris)	1841–1897	1891: Paints 'a marine subject' in Pereira's tempera during one of Pereira's Paris trial sessions (Pereira 1892g, p. 8). 1891: Creates a landscape at the same event (Pereira 1926, p. 15)
	Zuber, Henri (Paris)	1844–1909	1891: Participates in one of Pereira's Paris trial sessions (Pereira 1892g, p. 8). 1891: Executes two landscapes in Pereira's tempera, on canvas and on panel, during that trial session (Pereira 1926, p. 30). 1893: Exhibits a landscape in Pereira's tempera paint (Munich 1893, p. 67)
Finland	Gallen [-Kallela], Akseli (Ruovesi)	1865–1931	1896: Paints in tempera ('détrempe') and thinks that Pereira's procedure would become very popular in Finland if his paints were made available (Pereira 1909, p. 117)
Germany	Aster, Georg (Loschwitz, Dresden)	1848–1917	1905: Employs Pereira's 'Tempera colors' and <i>Mediumfarben</i> for watercolour painting and mural painting (Pereira 1909, pp. 141–142)
	Biedermann, Eduard (Weimar)	1864–1947	1892: Uses Pereira's 'Tempera colors', probably for easel painting (Pereira 1892g, p. 25) and Pereira's manner of painting ('Malweise') (Pereira 1909, p. 98)
	Bredt, Ferdinand Max (Munich; Ruhpolding near Stuttgart)	1860–1921	1893: Has employed Pereira's paints ('Farben') for mural painting (in the public baths in Stuttgart) (Pereira 1893a, p. 3; Pereira 1909, pp. 107–108), in cooperation with Paul Kämmerer (Germany). 1904: Uses Pereira's prepared cardboards ('Malpappe') and paints for easel painting (Pereira 1909, pp. 139, 140)
	Cissarz, J[ohann] V[inzenz] (Darmstadt)	1873–1942	1904: Uses Pereira's <i>Mediumfarben</i> and canvases ('Leinwanden') (Pereira 1909, p. 135)
	Dahl, Hans (Charlottenburg)	1849–1937	1900: Uses Pereira's paints ('Farben') for watercolour painting (Pereira 1909, p. 125)
	Dippel, Leopold (Darmstadt)	1827–1914	1896: Uses Pereira's paints ('Temperafarben') and canvas ('Leinwand') (Pereira 1909, p. 115)
	Düssel, Berthold (city of residence not found)	1874–?	1896: Uses Pereira's paints ('Temperafarben') and canvas ('Leinwand') (Pereira 1909, p. 115)
	Eckmann, Otto (Munich)	1865–1902	1892: Employs Pereira's 'Resin colors' for the finishing of paintings (Pereira 1892g, p. 24)
	Fahrenkrog, Ludwig (Barmen)	1867–1952	1898: Uses Pereira's paints and canvases ('Farben und Leinwanden') (Pereira 1909, p. 120)

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Germany	Fehr, Conrad (Berlin)	1854–1933	1893: Praises the effect of Pereira's 'Fixatif' on pastels (Pereira 1893a, p. 32)
	Fischer, Clara (Berlin)	1856–?	1893: Exhibits a painting executed in tempera paints ('Temperafarben'), which she left unvarnished (Munich 1893, p. 70)
	Fleischer, F[erdinand Robert] (Charlottenburg)	1858–?	1894: Uses Pereira's tempera paints ('Temperafarben') for watercolour painting (Pereira 1909, p. 111)
	Fürst, Edmund (Berlin)	1874–1955	1905: Uses Pereira's 'Tempera colors' ('Leim-Temperafarben') for easel painting (Pereira 1909, p. 145)
	Gesellschapp, G. [sic? probably: Geselschap, Friedrich] (Berlin)	1835–1898	1893 or before: Testifies that Pereira's paints ('Temperafarben'), which he has used for sketches, are the best tempera paints in existence (Pereira 1893a, preface)
	Geyer, [Johann] Leonhard (Leipzig)	1842–1915	1895: Uses Pereira's paints ('Farben') for watercolour work (Pereira 1909, p. 112)
	Gibo, Arthur (Eberfeld)	not found	1905: Uses Pereira's 'Tempera colors' for underpainting when painting in oil; uses Pereira's 'Varnish' (Pereira 1909, p. 142)
	Gmelich (Göppingen)	not found	1906: Uses Pereira's products ('Fabrikate'); purpose not specified (Pereira 1909, p. 148)
	Goller, Joseph (Leipzig)	1868–1947	1904: Employs <i>Mediumfarben</i> and Pereira's vehicles; purpose not specified (Pereira 1909, p. 135)
	Graf, Franz (Frankfurt)	1840–1915	1899: Recommended Pereira's <i>Mediumfarben</i> to his friend Th. Martin (Frankfurt) (Pereira 1909, p. 124)
	Hälssig, R. (Chemnitz)	not found	1907: Uses <i>Mediumfarben</i> ; purpose not specified (Pereira 1909, p. 151)
	Hancke, Erich (Berlin)	not found	1905: Uses Pereira's paints ('Temperafarben', 'Farben'); purpose not specified (Pereira 1909, pp. 143–144)
	Hartig, [Karl] Ludwig (Friedenau near Berlin)	1878–1953	1907: Successfully tested Pereira's paints ('Pereirafarben') and now plans to test the 'Tempera colors' ('reine Temperafarben') (Pereira 1909, p. 150)
	Hartmann, Hugo Friedrich (Bardowiek)	1870–1960	1901: Uses <i>Mediumfarben</i> for easel painting (Pereira 1909, p. 126). 1902: Ditto; H. also likes Pereira's 'Tempera colors' ('ihre reine Wasser-Temperatechnik') (Pereira 1909, p. 130)
	Haun, J[osef] (Fügen, Tyrol)	?–1963	1903: Uses 'Tempera colors' for mural painting (Pereira 1909, p. 130)

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Germany	Heim, H[einrich] (Nuremberg)	1850–1935	1903: Uses Pereira's prepared canvases and paints ('Pereirasche Farben') for underpainting (H. finishes in oil) (Pereira 1909, p. 130)
	Helpenstein, Fritz (Hildorf am Rhein, Eberfeld)	not found	1905: Reports that <i>Mediumfarben</i> were used in classes for tempera painting (Pereira 1909, pp. 142–143) and that he has received a batch of Pereira's paints ('Farben') and has distributed them among colleagues (Pereira 1909, p. 146)
	Hendrich, Hermann (Berlin)	1854–1931	1891: States that Pereira's painting materials ('Farbenmaterial') are the best he has ever encountered (Pereira 1909, p. 96). 1891: Paintings executed by H. in Pereira's tempera are mentioned (and praised) in an exhibition review in October 1891 (Pereira 1926, p. 18). 1893: Exhibits two paintings, one of them varnished with Pereira's 'Varnish', the other painted on one of Pereira's canvases ('Malleinwand') in (probably Pereira's) tempera paints ('Tempera-Farben') (Munich 1893, p. 51). 1898: Also tries other products, but always returns to Pereira's paints ('Pereirafarben') (Pereira 1909, p. 120). 1899: Uses <i>Mediumfarben</i> (Pereira 1909, p. 125)
	Henschel, [Gallus] Emil (Charlottenburg)	1865–1923	1893: Uses Pereira's paints ('Farben') and tempera technique; combines 'Tempera siccatif' with egg yolk (Pereira 1909, pp. 105–106)
	Hildebrandt, H. (Braunschweig)	not found	1905: Uses 'Tempera colors' and <i>Mediumfarben</i> , the latter in combination with 'Resin medium'; purpose not specified (Pereira 1909, p. 144). 1906: Uses 'Tempera colors', always in combination with <i>Mediumweiss</i> ('Weiss') (Pereira 1909, p. 148)
	Hofer, Gottfried (Hamburg)	1858–1932	1892: Likes 'Majolica colors' and 'Resin colors' on Majolica canvas (Pereira 1892g, p. 23; Pereira 1909, pp. 96–97)
	Homolka, Heinrich (Marienfelde)	1859–1944	1898: Likes Pereira's paints and canvases ('Pereira-Temperafarben und Leinwanden') (Pereira 1909, p. 122)
	Kämmerer, Paul (Stuttgart)	1868–1950	1893 or before: Has used Pereira's paints ('Farben') and 'Siccatif' for mural paintings in the church of Freudenstadt (Germany) and in the public baths in Stuttgart (Pereira 1893a, pp. 3–4). 1893: Has cooperated with Ferdinand Max Bredt (Germany) on the execution of mural paintings (in the public baths in Stuttgart) using Pereira's paints ('Farben'), thinning them with 'Tempera siccatif' and water (Pereira 1909, p. 108)
	Kemmer, Otto (Karlsruhe)	1853–1931	1905: Has tested Pereira's paints ('Pereira Temperafarben'), 'Fixatif' and vehicles and likes them (Pereira 1909, pp. 144–145)

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Germany	Kirsch, Johanna (Munich)	1856–?	1893: Exhibits four paintings executed on Pereira's 'chalk ground' (' <i>Kreidegrund</i> ') and painted in 'Tempera colors' combined with 'Resin varnish' (' <i>Harzfirnis</i> ') and is unhappy with the results. However, at least part of her problem must be due to the fact that she has attempted to thin 'Tempera colors' (soluble in water) with 'Resin varnish' (soluble in turpentine) (Munich 1893, pp. 57–58; <i>TMM</i> 1910b, p. 192)
	Kolb [Gustav?] (Göppingen)	not found	1906: Uses Pereira's products (' <i>Fabrikate</i> '); purpose not specified (Pereira 1909, p. 148)
	La Roche, Maria (Frankfurt am Main; Quincy-Segy)	1870–1952	1899: Orders <i>Mediumfarben</i> (for easel painting) on Hans Thoma's (Germany) recommendation (Pereira 1909, p. 123). 1902: Orders 'Tempera colors' and <i>Mediumfarben</i> (Pereira 1909, p. 129)
	Lasius, Wilhelm (Haltingen)	1871–1956	1901: Uses Pereira's 'fabulous material' for a large painting (Pereira 1909, p. 126)
	Lechter, Melchior (Berlin)	1865–1937	1892: Uses 'Tempera colors' (' <i>Temperafarbe</i> ') for a mural and for the copy of a Botticelli painting (Pereira 1893a, preface and pp. 30–31; Pereira 1909, pp. 100–101). 1902: Explains that he used 'Tempera colors' and a mixture of 'Fixatif' and egg yolk for an (unnamed) painting, eight years earlier (Pereira 1909, p. 128)
	Matschass, Erich (Charlottenburg)	1866–1946	1894: Employs Pereira's paints (' <i>Farben</i> ') for a very large painting (Pereira 1909, pp. 110–111)
	Mayerhofer, Max (Karlsruhe)	not found	1905: Asks for a price list (Pereira 1909, p. 148)
	Mebert, Richard (Dresden)	not found	1905: Employs Pereira's paints (' <i>Temperafarben</i> ') for watercolour painting (Pereira 1909, pp. 140–141)
	Meyn, Georg [Ludwig] (Berlin)	1859–1920	1892: A portrait by M. in Pereira tempera is mentioned in the journal <i>Atelier</i> (Pereira 1892g, p. 24)
	Miller, Paul (Plauen)	1878–1948	1906: Has been using Pereira's paints (' <i>Temperafarben</i> ') almost exclusively for years (Pereira 1909, p. 148)
	Mittag, H[einrich] (Hannover)	1859–1920	1899: Uses <i>Mediumfarben</i> ; purpose not specified (Pereira 1909, p. 123)
	Möckel, C. (Kiel)	not found	1904: Use of ' <i>Tempera-Pereira-Farben</i> ' for watercolour painting (Pereira 1909, p. 137–138)
	Modersohn, Otto (Bremen)	1865–1943	1902 (September): Uses <i>Mediumfarben</i> for easel painting; (November): Orders <i>Mediumfarben</i> (Pereira 1909, p. 129)

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Germany	Momme Nissen, Benedikt (Deezbüll)	1870–1943	1892: Likes Pereira's paints (' <i>Farben</i> ') (Pereira 1909, p. 99)
	Morgenstern, Carl Ernst (Breslau)	1847–1928	1892: Uses 'Tempera colors' (Pereira 1892g, p. 22) and 'the technique' (' <i>die Technik</i> '), because 'the tones of Tempera colors are incomparably superior to those of oil colors' (Pereira 1909, p. 97)
	Müller, Alois (Munich)	1861–1951	1893: Exhibits a work the underpainting of which is executed in Pereira's tempera paint; the next layer is executed in oil, but the varnish is Pereira's 'Varnish' (' <i>Harzfirnis</i> ') (Munich 1893, p. 75)
	Müller, C. V. (Berlin)	not found	1905: Thinks that Pereira's paints (' <i>Farben</i> ') are the best materials in existence; purpose not specified (Pereira 1909, p. 146)
	Müller, Walther (Reichenhain/Chemnitz)	not found	1905: Uses <i>Mediumfarben</i> ; purpose not specified (Pereira 1909, p. 147)
	Neese, Erwin (Neu-Ruppin)	not found	1905: Uses <i>Mediumfarben</i> ; purpose not specified (Pereira 1909, p. 145)
	Oberländer, Adolf Adam (Munich)	1845–1923	1892: Uses Pereira's tempera (Pereira 1909, p. 98). 1892 (or before): Likes Pereira's paints (Pereira 1892g, p. 23). 1901: Employs 'Majolica canvas' for painting in watercolour and gouache (Pereira 1909, pp. 125–126). 1903: Uses Pereira's 'prepared canvases with the [...] water insoluble chalk ground' (it is not clear to which product O. is referring) (Pereira 1909, p. 130)
	Olde, Hans (Weimar)	1855–?	1902: Uses prepared canvases and cardboards (' <i>Malleinen und Kartons</i> ') (Pereira 1909, p. 128).
	Papperitz, G[eorg] (Munich)	1846–1918	1892: After having employed Pereira's paints (' <i>Farben</i> ') for underpainting for a while, P. has now begun to use the full procedure (Pereira 1909, p. 98)
	Perkuhn, Edwin (Meisterfelde)	1861–1943	1892: Uses Pereira's tempera paints (' <i>Temperafarben</i> ') and follows Pereira's guidelines (Pereira 1909, p. 98). 1902: Uses prepared cardboards (' <i>Malpappen</i> ') (Pereira 1909, p. 130). 1905: Uses Pereira's paints (' <i>Farben</i> ') (Pereira 1909, pp. 145–146)
	Plappert, Wilhelm (Munich)	1856–1925	1890: Uses Pereira's paints (' <i>Pereira-Farben</i> ') for theatre stage painting (Zechmeister 1890, p. 207)
	Pondel, Friedrich (Munich)	(1830–?)	1893: Exhibits a painting in Pereira's tempera paint; he finds the technique difficult (Munich 1893, pp. 63–64)
	Rickelt, Karl (Munich)	1857–1919	1892: Uses ' <i>Temperafarben</i> ' for watercolour and unspecified Pereira products for mural painting (Pereira 1909, p. 99)

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Germany	Sattler, J[ohann] E[rnst] (Loschwitz, Dresden)	1840–1923	1894: Uses <i>Pereira-Temperafarben</i> and two of the vehicles (' <i>Flüssigkeiten</i> ') on plaster (Pereira 1909, p. 110)
	Schauffele, C. (Schwäbisch Hall)	not found	1898: Uses Pereira's paints (' <i>Farben</i> '); purpose not specified (Pereira 1909, p. 120)
	Schlotke, C. (Barmen)	not found	1904: Teaches at the local school for arts and crafts; he has been using Pereira's 'Tempera colors' for years and advises his students to use them. He has just tested <i>Mediumfarben</i> and likes them, too (Pereira 1909, p. 137)
	Schmidt, J. (Berlin)	not found	1894: Uses Pereira's paints (' <i>Farben</i> ') for coloured drawings that are reproduced in fashion magazines (Pereira 1909, p. 109)
	Schmidt, Oskar (Leipzig)	not found	1898: Sometimes uses Pereira's paints and technique (' <i>Farben und Maltechnik</i> ') (Pereira 1909, p. 122)
	Schmitgen, Georg (Berlin)	1856–1903	1891: Uses tempera paints (' <i>Temperafarben</i> '); purpose not specified (Pereira 1909, p. 96)
	Schömbs, Friedrich (Offenbach)	not found	1894: Uses ' <i>Temperafarben</i> ', probably for lithography (Pereira 1909, p. 110)
	Schönleber, Gustav (Karlsruhe; Rothenburg ob der Tauber)	1851–1917	1890 (or before): Spent some days in Pereira's studio in Stuttgart to learn the procedure and is currently employing it to paint large landscapes (Zechmeister 1890, p. 206). 1906: Has used Majolica canvas for the very large painting <i>Strassburg</i> in the Reichstagsgebäude in Berlin eight years previously; now he orders more of the same for another large painting (<i>Rothenburg</i> , probably for the same location) (Pereira 1909, p. 149)
	Schraegle, Gustav (Frankfurt)	1867–1925	1897: Orders a batch of 'Tempera colors' (Pereira 1909, pp. 117–118)
	Schreiber, G. (Krefeld)	not found	1904: Teaches decorative painting at the local school for arts and crafts; he has successfully used 'Tempera colors', which he varnished, for decorative painting (Pereira 1909, pp. 139–140)
	Schröder, Ed. (Erfurt)	not found	1902: Uses 'Tempera colors' for diverse applications within the area of arts and crafts (Pereira 1909, p. 129)
	Schröter, K. (Leipzig)	not found	1905: Uses 'Tempera colors' and <i>Mediumfarben</i> (' <i>Leim- und Medium-Tempera</i> ') (Pereira 1909, p. 147)
	Schultze-Naumburg, Paul (Berlin)	1869–1949	1899: Has given up on 'Tempera colors'; now uses <i>Mediumfarben</i> for easel painting (Pereira 1909, p. 123)
	Schütze, Wilhelm (Hamburg)	probably 1840–1898	1896: A decorative painter who uses Pereira's paints (' <i>Farben</i> ') (Pereira 1909, p. 116)

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Germany	Selzer, Carl (Munich)	1872–?	1893: Exhibits two paintings worked in Pereira's tempera (Munich 1893, p. 51)
	Siebner, Arthur (Böhlitz)	1875–1948	1901: Is 'now' happy with the 'material' (Pereira 1909, p. 127)
	Smith, Frank E. (Munich)	1865–1936	1893: Exhibits a landscape painted in Pereira's tempera (Munich 1893, p. 50)
	Sohn-Rethel, Otto (Düsseldorf, Rome)	1877–1949	1906: Uses Pereira's paints ('Farben'); purpose not specified (Pereira 1909, pp. 147–148). 1907: Ditto (Pereira 1909, pp. 150–151)
	Stuntz, J. H. (Bremen)	not found	1904: Has tested 'Tempera colors' and <i>Mediumfarben</i> for watercolour painting; plans to use 'Tempera colors' ('Leim-Tempera') (Pereira 1909, pp. 138–139)
	Thoma, Hans (Oberursel)	1893–1924	1897: Uses <i>Mediumfarben</i> for easel painting (Pereira 1909, pp. 118–119). 1909: Named among the artists who supported Pereira in his 'battle' for many years (Pereira 1909, p. XI)
	Trowitsch & Sohn, Kunstanstalt (Frankfurt an der Oder)		1896: Artists working for Trowitsch & Sohn use 'Tempera colors' for watercolour paintings, and Pereira's paints ('Farben') for executing copies of 'Old Masters' (Pereira 1909, p. 114)
	Ungewitter, Hugo (Stotel)	1869–c.1944	1897: Uses Pereira's paints ('Farben'); purpose not specified (Pereira 1909, p. 118)
	Vinnen, Carl (Hannover)	1863–1922	1904: Has created a painting combining powder pigments with Pereira's vehicles, 'Fixatif' and 'Varnish' ('Harzfirnis') (Pereira 1909, p. 135)
	von Bartels, Hans (Munich)	1856–1913	1892: Uses paints manufactured according to Pereira's system ('nach dem Pereiraschen System hergestellte Farben') for watercolour painting (Pereira 1909, p. 96; Pereira 1892g, pp. 20–21). 1893: Exhibits a painting executed in Pereira's tempera paints ('Temperafarben') (Munich 1893, p. 72). 1909: Named among the artists who supported Pereira's 'battle' for many years (Pereira 1909, p. XI)
	von Bohn, German (Stuttgart)	1812–1899	1892: Uses Pereira's 'color-technics' (sic) for easel painting (Pereira 1892g, pp. 21–22). 1893: Exhibits a painting executed in tempera paints ('Temperafarben') (Munich 1893, p. 67)
	Diez, Wilhelm von (Munich)	1839–1907	1909: Named among the artists who supported Pereira's 'battle' for many years (Pereira 1909, p. XI)
	von Felbinger, Franz (Schöllschitz)	1844–1906	1896: Uses Pereira's paints ('Farben'); purpose not specified (Pereira 1909, p. 117).

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Germany	von Holstein, George (Munich)	not found	1902: Finds <i>Mediumfarben</i> suitable for underpainting, but too clumsy for finishing a painting (Pereira 1909, pp. 128–129)
	von König, Leo (Berlin)	1871–1944	1905: Uses 'Tempera colors'; purpose not specified (Pereira 1909, p. 143)
	von Lenbach, Franz (Munich)	1836–1904	1890 (or before): Has painted a portrait of the German emperor as well as other portraits in Pereira's technique and tempera paints (' <i>nach diesem Verfahren und mit den Pereiraschen Temperafarben</i> ') (Zechmeister 1890, p. 206). 1891: Paintings by L. in Pereira's tempera are used by Pereira as demonstration pieces in his Paris trial sessions (Pereira 1892g, p. 8). 1892: States that Pereira's tempera paints (' <i>Temperafarben</i> ') and all accompanying products are excellent (Pereira 1893a, p. 5; Pereira 1909, p. 102). 1892–1893: Executes (among other works) six portrait sketches in Pereira's tempera that enter into Pereira's possession (Pereira 1926, pp. 22, 25, 26, 29). 1893: Exhibits a painting in Pereira's tempera (Munich 1893, p. 94). 1893: Created the ceiling painting of the German art section in the World's Fair in Chicago using Pereira's tempera paints and 'Resin colors' (Pereira 1893d, p. 307; Kinseher 2014, pp. 68–69). 1909: Named among the artists who supported Pereira's 'battle' for many years (Pereira 1909, p. XII)
	von Liezen-Mayer, Alexander (Munich)	1839–1898	1909: Named among the artists who supported Pereira's 'battle' for many years (Pereira 1909, p. XII)
	von Marr, Carl (Munich)	1858–1935	1891: A painting by M. in Pereira's tempera is used as a demonstration piece in Pereira's Paris trial session (Pereira 1892g, p. 8)
	von Max, Gabriel (Munich)	1840–1915	1893: Exhibits a study in Pereira's tempera manner (' <i>Temperamanier</i> ') (Munich 1893, p. 66). 1897: Uses Pereira's canvases and grounds (' <i>Mal-Leinwanden und Grundierungen</i> '), as well as his 'Tempera colors' and vehicles for underpainting (Pereira 1909, p. 117). 1905: Declares that Pereira's manner of painting is like the technique used by the Old Italian Masters, and more durable than any other tempera (Pereira 1909, pp. 141, 143; Pereira 1926, p. 18). 1909: Named among the artists who supported Pereira's 'battle' for many years (Pereira 1909, p. XI)
	von Pereira-Arnstein, Alfons Ludwig; Baron (Stuttgart)	1845–1931	1893: Exhibits a painting in his own tempera technique (Munich 1893, p. 55)

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Germany	von Schlichtegroll-Engelswacht, Karl Felix [identical to Carl Felix von Schlichtegroll] (Munich, Berlin)	1862–1946	<p>1893: Exhibits a painting in Pereira's tempera paint (Munich 1893, p. 51).</p> <p>1894: Found a school for teaching Pereira's procedure in Berlin.</p> <p>1897: Publishes a book on Pereira's procedure (Schlichtegroll 1897)</p>
	von Seitz, Rudolf (Munich)	1842–1910	<p>1892 (or before): Uses the combination of 'Tempera colors' with egg yolk and 'Fixatif' to paint a large ceiling (Pereira 1892g, pp. 14–16).</p> <p>1892: States that Pereira's tempera paints ('Temperafarben') and all accompanying products are excellent (Pereira 1893a, p. 5; Pereira 1909, p. 102).</p> <p>1893: For painting in tempera S. uses Pereira's paints ('Farben') and adds egg yolk for pastose highlights (Pereira 1893a, preface and pp. 1–2, 30; Pereira 1909, pp. 106–107).</p> <p>1909: Named among the artists who supported Pereira's 'battle' for many years (Pereira 1909, p. XI)</p>
	von Stuck, Franz (Munich)	1863–1928	<p>1892: States that Pereira's tempera paints ('Temperafarben') and all accompanying products are excellent (Pereira 1893a, p. 5; Pereira 1909, p. 102).</p> <p>1893: Exhibits a painting executed in Pereira's tempera paints ('Temperafarben') (Munich 1893, p. 66).</p> <p>1909: Named among the artists who supported Pereira's 'battle' for many years (Pereira 1909, p. XI)</p>
	Wahle, F. (Munich)	1863–1927	1903: Uses Pereira's paints ('Farben') for watercolour painting (Pereira 1909, p. 134)
	Wahler, Gg. (Würzburg)	not found	1896: Uses Pereira's 'Tempera colors' for tapestry ('Gobelins') and fresco (Pereira 1909, p. 114)
	Wenig, Bernhard (Munich)	1871–1940	1893: Exhibits two paintings in Pereira's tempera paint (Munich 1893, p. 51)
	Wentscher, J[ulius] (Berlin)	1842–1918	1892: Uses Pereira's paints ('Farben'); purpose not specified (Pereira 1909, p. 101)
	Weyl, Hans (Kiel)	1863–?	1896: Uses Pereira's paints, canvases etc. ('Farben, Leinwanden usw.') (Pereira 1909, p. 116)
	Wiebking, Karl (Nuremberg)	not found	1904: Uses Pereira's paints ('Pereira-Tempera-Farben') for landscape sketches (Pereira 1909, p. 139)
	Windschmitt, Ludwig (Frankfurt am Main)	1848–1920	1897: Uses Pereira's mastic varnish ('Mastixfornis'), possibly for restoration purposes (Pereira 1909, p. 118)

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Germany	Wucherer, Fritz (Frankfurt am Main)	1873–1948	1898: Requests samples of ' <i>Temperafarben</i> ' (Pereira 1909, p. 119). 1898: Has received ' <i>Tempera colors</i> ' and <i>Mediumfarben</i> ; much prefers the latter (Pereira 1909, pp. 119–120). 1898: Uses <i>Mediumfarben</i> on paper (Pereira 1909, pp. 121–122). 1899: Uses <i>Mediumfarben</i> along with other brands of watercolours on paper (Pereira 1909, p. 124)
	Zimmermann, E[rnst] (Munich)	1852–1901	1892: Plans to work more with Pereira paints (' <i>Pereirafarben</i> ') (Pereira 1909, p. 99)
Hungary	Kriesch, Aladar (Budapest; Gödöllő)	1863–1920	1898: Uses Pereira's paints and canvases (' <i>Farben und Leinwanden</i> ') (Pereira 1909, p. 121). 1898: Chooses between ' <i>Tempera colors</i> ' and <i>Mediumfarben</i> depending on the character of the work he plans to create (Pereira 1909, pp. 122–123). 1903: Reports that he has first used Pereira's ' <i>Tempera colors</i> ' in 1891 or 1892, and that he often works with an oil/egg-emulsion to which he adds Pereira's ' <i>Resin medium</i> '. He specifies that for 'purely decorative' works he often uses Pereira's 'first tempera' (i.e. ' <i>Tempera colors</i> ') and for studies after nature, portraits etc. he uses the <i>Mediumfarben</i> (Pereira 1909, pp. 131–134)
	von Abranyi, Ludwig (Budapest)	1849–1901	1892 (or before): Uses ' <i>Tempera colors</i> ' for painting a large theatre curtain (Pereira 1892g, p. 24). 1892: Uses Pereira's paints (' <i>Farben</i> ') and ' <i>Tempera siccatif</i> ' not only for large paintings, but also for small watercolour-like (' <i>aquarellartige</i> ') portraits and silk fans (Pereira 1909, p. 102)
Italy	Bianchi, Mose (Milan)	1840–1904	1893: Has tested ' <i>Resin colors</i> ' and likes them for glazing over tempera; he thinks that Pereira's procedure (' <i>procedimento</i> ') is difficult, but that its results are rewarding (Pereira 1893a, pp. 5, 28; Pereira 1909, pp. 104–105). 1909: Named among the artists who supported Pereira in his 'battle' for many years (Pereira 1909, p. XI)
	de Albertis, Sebastiano (place of residence not found)	1828–1897	1892: Executes a painting of a horseman in Pereira's tempera during a Paris trial session (Pereira 1926, p. 21)
	de Maria, Mario (Venice)	1852–1924	1893: Exhibits a landscape in Pereira's tempera paint (Munich 1893, p. 70)
	Fragiacomo, Pietro (Venice)	1856–1922	1909: Named among the artists who supported Pereira's 'battle' for many years (Pereira 1909, p. XI)
	Gheri, Leopold (at time of reference: Genoa)	1866–1952	1898: Uses ' <i>Tempera colors</i> '; purpose not specified (Pereira 1909, p. 122)

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Italy	Sanquirico, Pio (Milan)	1847–1900	1893: Has tried the paints ('colori') and the procedure ('processo') and much prefers them to painting in oil (Pereira 1909, p. 104)
	Tito, Ettore (Venice)	1859–1941	1892: Creates a portrait in Pereira's tempera during a Paris trial session (Pereira 1926, p. 12). 1909: Named among the artists who supported Pereira's 'battle' for many years (Pereira 1909, p. XI)
	Villegas [y Cordero], José (Rome)	1848–1921	1893: Exhibits a sketch in Pereira's tempera paint (Munich 1893, p. 70)
Netherlands	Deutmann, T. (Heeze)	not found	1905: Uses Pereira's paints ('Farben') for easel painting (Pereira 1909, p. 146).
	van der Haar, H[ermann] (Utrecht)	1867–1938	1901: Likes <i>Mediumfarben</i> and 'all Pereira tempera paints' ('alle Pereiraschen Temperafarben'); purpose not specified (Pereira 1909, p. 127)
	von Mulerdt, Eugen (Kattwijk aan Zee)	1896–1963	1904: Has used Pereira's paints ('Farben') for watercolour painting; now plans to use them on canvas (Pereira 1909, p. 140)
Poland	Nowińska, A[licja] (Lodz)	1853–1908	1904: Uses <i>Mediumfarben</i> ; orders samples of prepared canvases ('präparierte Leinwanden') (Pereira 1909, p. 139)
Switzerland	Amiet, Cuno (Oschwand, BE)	1868–1961	1899: First (unsatisfactory) attempts with 'Tempera colors'; 1903: uses <i>Mediumfarben</i> for easel painting, sometimes in combination with oil paints (Beltlinger et al. 2015, pp. 55, 56, 70, 71)
	Born, Karl (Bern)	1864–1914	1898: Paints in oil (not tempera) on 'Majolica canvas' (Pereira 1909, p. 119). 1899: Likes the absorbent nature of Pereira's 'ground' ('Malgrund') (Pereira 1909, p. 124)
	Calame [Louis Severin Albert] (Winterthur)	1863–1931	1904: Uses Pereira's tempera; recommends Pereira's paints ('Farben') to his students (Pereira 1909, p. 138)
	Garnjobst, Hans (place of residence not found)	1863–1955	1900: Recommended Pereira's paints to the artist Frieda Liermann (Switzerland) (Pereira 1909, p. 125)
	Gasteton, Joseph / José (Paris, Oreslina, Belfaux)	1865–?	1897: According to the artist Laura Packeny (France), G. employs Pereira's technique very successfully (Pereira 1909, p. 117). 1897: Uses <i>Mediumfarben</i> (Pereira 1909, p. 119). 1904: Uses 'Tempera colors' in combination with an egg and resin medium, sometimes coated with 'Fixatif', on paper (Pereira 1909, pp. 136–137). 1907: Uses Pereira's paints ('Temperafarben') (Pereira 1909, p. 150)
	Giacometti, Giovanni Ulrico (Stampa)	1868–1933	1903: Cuno Amiet mentions in a letter that G. uses 'tempera Pereira' (Radlach 2000, p. 366)

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Switzerland	Liermann, Frieda (Basel)	1877–1958	1900 (March): Wants to test Pereira's paints (' <i>Temperafarben</i> '), because Hans Garnjobst (Switzerland) has recommended them. (May): Likes <i>Mediumfarben</i> and orders a batch (Pereira 1909, p. 125)
	Pfyffer, Niklaus (Lucerne)	1836–1908	1900: Paints in oil, uses tempera only for underpainting, but likes Pereira's 'canvas' (' <i>Leinwand</i> ') (Pereira 1909, p. 125)
	Robert, Léo-Paul-Samuel (Ried sur Bienne)	1851–1923	1902: Has decided to use Pereira's 'Tempera colors' (' <i>couleurs à la détrempe</i> ') for a large mural on canvas (Pereira 1909, p. 128) and goes through with it (staircase of the Palais de Justice Fédéral in Lausanne) (Beltlinger 2015, p. 42)
	Schweizer, Ernst (Zurich, writing to Pereira from Capri)	1874–1929	1901: Praises Pereira's 'canvas' (' <i>Leinwand</i> '), but does not specify what he uses for painting on it (Pereira 1909, p. 127)
	Colombi, P[linio] (Bern)	1873–1951	1903: Likes Pereira's paints (' <i>Farben</i> ') and recommends them to his colleagues (Pereira 1909, p. 134)
	Reckziegel, Anton (Bern)	1865–1936	1904: Has used Pereira's tempera for watercolour painting; now orders <i>Mediumfarben</i> (Pereira 1909, p. 134). 1907: Uses Pereira's paints (' <i>Pereira's Temperafarben</i> ') (Pereira 1909, pp. 134, 140). 1907: Uses one of Pereira's <i>Mediumweiss</i> (' <i>Cerusa</i> ') products for watercolour painting (Pereira 1909, p. 151)

1 Pereira mentions Pliny's *Naturalis historiae*, Dioscurides' *De materia medica*, the *Compositiones ad tingenda musiva* (Lucca MS), the *Schedula diversarum artium* of 'Theophilus', Heraclius' *De coloribus et artibus romanorum*, Cennino Cennini's *Il libro dell'arte*, the *Hermeneia*, *Il libro dei colori*, the *Secreti diversi* (Marciana MS), Rosetti's *Plichto de l'arte de tentori* and *Arte profumatoria*, Boltz von Ruffach's *Illuminierbuch*, the *Ricette per far ogni sorte di colori* (Paduan MS), van Mander's *Het Schilder Boek* and other treatises, the references to which are not clear enough to allow for their identification (Pereira 1891b, pp. 6, 10; Pereira 1909, p. 16).

2 'Bisso' (a bluish grey, made of Verona green earth, yellow ochre and vine black), 'bigia' (a yellowish grey, comprising Verona green earth and ultramarine) and 'pag-onazzo' (a reddish grey, made of Verona green earth, 'lapis amatisto' (hematite) and 'indaco baccadeo' (indigo). Pereira had found the Italian terms in Cennino Cennini's *Il libro dell'arte*.

3 A list of Pereira's pigments is given by Schlichtegroll (1897, pp. 33–35).

4 Before August 1991, Pereira had collected recommendations from Friedrich August von Kaulbach (1850–1920), Rudolf Seitz (1842–1910), Alexander von Liezen-Mayer (1839–1898), Alois Hauser (1841–1896), Franz von Lenbach (1836–1904), William-Adolphe Bouguereau (1825–1905), Toni Robert-Fleury (1837–1911) and possibly others (Pereira 1892g, p. 6).

5 Gabriel Ferrier (1847–1914), for example, who taught students from all over the Western world at the renowned Académie Julian, wrote to Pereira in January 1893: 'C'est avec grand plaisir que je vous adresse mes félicitations sur votre procédé, dont je suis de plus en plus content, et dont je me sers tous les jours. Je l'ai montré à mes élèves et déjà bon nombre s'en servent' ('It gives me great pleasure to congratulate you on your procedure, with which I am increasingly satisfied, and which I use every day. I have shown it to my pupils and already

a considerable number of them use it') (Pereira 1909, p. 103).

6 Pereira attended the congress together with Johann Gottlieb Müller, the Stuttgart-based manufacturer of his products. Müller had clearly been instructed by Pereira to appeal against the inclusion of paint manufacturers in the committee.

7 It is quite likely that Borucki had not taken into account the necessity of adding a vehicle to the tube paints when lamenting their lack of binding power.

8 'Pereira ist ein vollständiger Dilettant u. will Geld machen; es soll aber schon anfangen nach allen Seiten zu misslingen' (Pidoll 1894).

9 'Baron Alfons von Pereira hat erkannt, dass die alten Meister, wenn sie Ölfarben gebrauchten, beinahe ohne Ausnahme mit T. untermalt und zu diesem Zwecke ihre Farben nur mit dünnem Leim und Honig angesetzt und erst beim Malen das für die jeweiligen Zwecke passende Malmittel (Leim, Gummi, Eigelb oder Feigenmilch) frisch beigemischt haben. Zum Vollenden des Bildes nahmen sie zuweilen noch Harz- oder Ölfarben. Nachdem es ihm gelungen, die Farben, Malmittel und Leinwand an der richtigen, den Vorschriften der älteren Meister entsprechenden Weise herzustellen, hat er die Temperatechnik in ein neues System gebracht. [...] Ein derart a tempera gemaltes Bild besitzt ungefährniss den feinen Zauber des Pastells und erhält gefährniss, da die Temperafarbe den Firnis vollständig aufsaugt und bis auf den Grund eindringen lässt, die grösste Leuchtkraft und Transparenz. Die Farben, Malmittel, Leinwand an u.s.w. werden hergestellt von J.G. Müller in Stuttgart' ('Baron Alfons von Pereira has found out that the old masters, when they used oil paint, nearly always executed their underpainting in tempera. For this they ground their colours in thin size and honey, and combined them with the appropriate fresh vehicle (size, gums, egg yolk or fig milk). To complete a painting they sometimes used resin or oil paints. After he has succeeded in producing the paint, vehicles and canvases in the correct manner that

corresponds to the rules of the older masters, he developed a new system of painting in tempera. [...] A painting created in such a tempera has the magic of a pastel. Once it is varnished it has great luminance and transparency, because the tempera paint absorbs the varnish completely and lets it penetrate through to the ground. The paints, vehicles, canvases etc. are produced by J.G. Müller in Stuttgart'). The author would like to thank Stefan Zumbühl for pointing out this reference.

10 In his testimonial of 1897 the artist Hans Thoma mentions 'Mediumtemperafarben [...] and their associated vehicle (an emulsion)' (Pereira 1909, p. 118; see also Table 4), but in later years Pereira stresses that no separate vehicle is required with his *Mediumfarben*.

11 'Herr Professor Linke scheint niemals meine Temperafarben gesehen, geschweige denn sie untersucht zu haben; denn sonst müsste er wissen, dass sie keine Spur Essigsäure enthalten, noch je enthalten haben.'

12 Also spelled Kaspar und Dr. Vogl, Kaspar u. Dr. Vogl, or Kaspar & Dr. Vogl.

13 These paintings were created by the artists Sebastiano de Albertis (1828–1897), Camille Pissarro (1830–1903), Franz von Lenbach (1836–1904), Elisabeth Jane Bouguereau (1837–1922) or William-Adolphe Bouguereau (1825–1905), Edmond Yon (1841–1897), Edouard Charlemont (1842–1906), Henri Zuber (1844–1909), Jean Baptiste Edouard Detaille (1848–1912), Albert Besnard (1849–1934), Ettore Tito (1859–1941) as well as by Pereira himself.