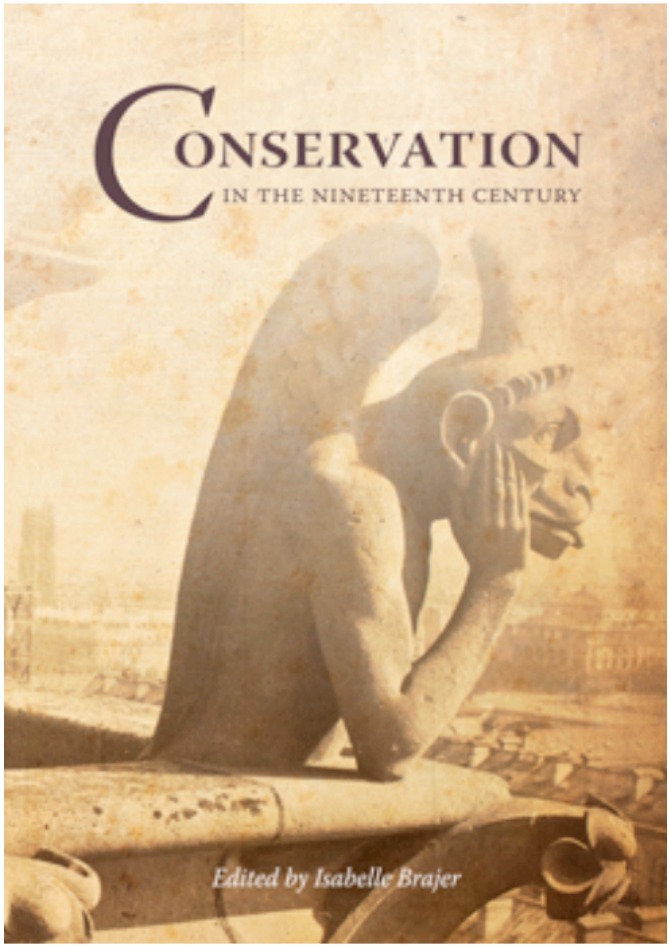

2013 The search for an enduring painting technique: Franz Fernbach and his encaustic technique as a restoration procedure in the early nineteenth century, in: I. Brajer (ed.): Conservation in the 19th Century, London 2013, 105-115.

The search for an enduring painting technique: Franz Fernbach and his encaustic technique as a restoration procedure for wall-paintings in the early nineteenth century

Barbara Beckett

Introduction

Conservation in the late eighteenth and early nineteenth century was influenced by various social upheavals, carried by the intellectual atmosphere of change across Europe. Architecture, and therefore architectural decoration, as an important public genre, played a key role in the field of conservation. Discoveries of monumental art from the past led to a growing interest in medieval art forms throughout Europe. The interest in art was intertwined with the search for national identities as new nation states formed. The focus on the newly appreciated cultural heritage was a multifaceted interest, and included preservation, interpretation and presentation issues. It led to the collection, study and conservation of artworks, and to the creation of new works in historical styles. This movement also resulted in the systematic search and uncovering of medieval wall-paintings, which had been whitewashed or covered with plaster, mainly during the period from the sixteenth to the eighteenth century.

While Europe was exploring its own medieval past, it also nurtured archaeological excavations in Greece and Italy in an effort to reveal and understand the ancient past. In the field of wall-paintings, the most influential findings were from the excavations of the ancient cities of Campania, Herculaneum and Pompeii in 1711 and 1738,[1] which had fallen with the eruption of Mount Vesuvius on 24 August, AD 79. The exquisitely preserved Roman wall-paintings inspired much research, which focused on the exploration of painting materials and techniques. This resulted in a continuing, highly emotional dispute regarding the exact technique used for the creation of these wall-paintings.

Italian, French and German scientists, artists and philologists tried to prove that these well-preserved, strongly coloured paintings could only have been made using the ancient encaustic painting technique, the details of which had been passed down mainly via antique scripts and were, therefore, shrouded in mystery. Only a few small encaustic paintings on wood had survived from antiquity. The investigations took a multidisciplinary approach, combining historical research with practical experiments in an effort to recreate the encaustic technique. Historical sources such as the *Ten Books of Architecture* by Vitruvius Pollio[2] (written in the last quarter of the first century BC) and the *Natural History* of Gaius Plinius Secundus (published *c*. AD 77–79)[3] were studied, compiled, translated and published. Scientific analyses, such as wet chemical separation processes, heating and odour tests were used to examine the paintings (Knirim 1839: 54). Such scientific tests were new to conservation at that time. Further developments in the field of wall-painting conservation derived from these discoveries and results were the refinement of detaching wall-paintings and the search for a protective coating for wall-paintings.

This paper focuses on a case in which the encaustic technique was used in the conservation of wall-paintings. It will explore the reasoning for this treatment and focus on the historical events and people that led to this case, in particular the Bavarian painter Franz Fernbach, one of the main nineteenth-century enthusiasts of this technique. This case study shows an example where the broad Europe-wide interest in the painting technique found a niche application in conservation.

Recreation of the encaustic painting technique

By the middle of the nineteenth century, the quest to recreate the actual technology of the well-preserved excavated Campania wall-paintings had changed into a search for a formulation for an enduring painting system, such as the encaustic painting technique appeared to be. This change in the focus arose from the need to decorate the ambitious newly planned public buildings in the new European metropolises. The movement to create new painting materials and techniques based on the encaustic technique became completely independent from the early quest to copy this practice. Therefore, it was not considered to be a problem that by this

time it had become widely acknowledged that the true Roman painting technique of the Campania wall-paintings was the *fresco* technique with *secco* finishing, and not encaustic.

Taking into account the vast amount of new architectural decorations, it was clear that the invention of a suitable type of paint would have been a prestigious achievement with a strong commercial interest. This undoubtedly explains the large amount of ideas and formulae that were hastily published, but also some that were kept secret during the applications for patents. Many publications were quickly translated between the Italian, French, English and German languages or distributed with an annotated summary. They appeared in a wide range of publications, from manuals and articles in scientific journals to articles in general newspapers for the more educated general audience.

The original belief that encaustic paint was used on ancient wall-paintings led to the invention of new painting techniques, materials and complex mixtures, mainly made of wax, natural resins and gums. As a result of this process, additional new techniques were created, such as stereochromy,[4] invented by the chemist Johann Nepomuk Fuchs (1774–1856) in 1825 in Munich, in which water glass (soluble sodium or potassium silicate) was used as a binding medium. The movement focusing on experimental painting techniques in this region found a particularly avid advocate in the person of the art-loving prince, who later became King Louis I of Bavaria (1786–1868). He supported painters and paint technicians in the development of an enduring painting technique for his numerous new public buildings with their monumental historical murals. As a result, in addition to Paris, Munich became a centre of these ambitious efforts. Inspired by his travels to Italy and Greece, King Louis I commissioned wall-painting cycles for his Neu Residenz in Munich. Supported by the leading architect, the painter Leo von Klenze (1784–1864), he changed the initial plan to execute the decoration of this building in the *a fresco* technique to encaustic. Von Klenze had returned from a trip to Paris in 1836, at which time he became acquainted with this technique. He enthusiastically described the transparency and smoothness of the retouching executed in the encaustic technique developed by the painter Jacques-Nicolas Paillot de Montabert (1771–1849), which he had seen in the conservation work of the frescoes in Fontainebleau. In the end, King Louis I allowed the German painter Schnorr von Carolsfeld (1794–1872) to make the final choice regarding which of the various encaustic painting techniques to implement (Marggraff 1840). A commission was formed of renowned scientists in Munich, including Max von Pettenkofer (1818–1901),[5] to support the decision, which focused on two different encaustic techniques, that of Montabert and that of the painting technician Franz Fernbach (1793–1851), the leading figure in the recreation of an encaustic painting technique in Munich. Therefore, in April 1837, a set of test panels was prepared for this purpose, and a thorough evaluation of the durability of the paint was carried out. The surfaces of the test panels were exposed to ethanol, turpentine, hydrogen sulphide, acetic acid and heat. Fernbach was able to show that his encaustic paint was very durable and impervious to environmental and chemical attack (Marggraff 1840: 247; Fernbach 1845: 87–99). Subsequently, King Louis I authorised the use of Fernbach's technique.

Franz Fernbach and his contribution to the recreation of the encaustic painting technique

The painter Franz Xaver Fernbach was born in 1793 near Freiburg, and died in 1851 in Munich. Constantly under financial pressure, he attended the Academy in Munich from 1816 to 1819. He attracted the interest of King Maximilian I of Bavaria (1756–1825) who, like the son who succeeded him, was interested in inventive painting techniques. This sponsorship enabled Fernbach to carry out his studies in chemistry, physics and mineralogy at the University of Vienna (Austria) and Landshut (Germany) in 1820. Later, King Louis I and von Klenze initiated and supported Fernbach's research in the recreation of an encaustic painting technique. However, to Fernbach's great disappointment, a planned visit to Pompeii to investigate the technique *in situ* never took place. For a short period, Fernbach stood at the forefront of paint research in Munich. He published three books: *Ueber Kenntniss und Behandlung der Oehl-Farben* (*About the Knowledge and Handling of Oil-Paint*) in 1834; *Die Oelmalerei* (*Oil Painting*) in 1843); and *Die Enkaustische Malerei ein Lehr- und Handbuch für Künstler und Kunstfreunde* (*Encaustic Painting: An Instruction Manual and Handbook for Artists and Art Lovers*) in 1845. Fernbach was not allowed to publish information about his encaustic painting technique earlier because King Louis I requested that it be kept secret for a while. This was supposedly because the king wanted to reserve this painting technique exclusively for his buildings.

Fernbach revealed his special encaustic formula and technique in his manual from 1845. In the first 100 pages he described in great detail the history of the encaustic technique from antiquity to its recreation in the late eighteenth and early nineteenth century, and expounded on the merits of this rediscovery. In doing so, he demonstrated a broad knowledge of national and international publications. Fernbach regarded the French Count Claude Philippe de Caylus (1692–1765) as the pioneer of the encaustic rediscovery movement. De Caylus' book *Memoire sur la peinture l´ecaustique et sur la peinture á la cire* (*Memorandum on the Encaustic Painting and the Painting with Wax*) was published in 1755 in Paris. De Caylus owed the international dissemination of his theories on encaustic techniques to the English translation published in 1760 by Johann Heinrich Müntz (1727–1798)[6] under the title: *Encaustic or, Count Caylus's Method of Painting in the Manner of the Ancients*. Fernbach included another important contribution to the research in the recreation of the encaustic technique in his first chapter, namely the complete chemical analyses and results from painted plaster fragments from an Egyptian tomb and wall decorations from Pompeii, carried out by Professor Philipp Lorenz Geiger (1785–1836) at the University of Heidelberg. The analysis showed that for all the different pigments, an organic binding medium that could not be specified further had been used, and a wax varnish had been applied to some of the colours (Fernbach 1845: 34–49).

After this broad introduction, Fernbach described his own encaustic technique in detail, including the preparation of the individual material components, the mixtures and the application. To avoid later damage, the painting had to be executed on dry, carefully prepared, open porous plaster, because any

Figure 1 Forchheim Castle, Chapel, west wall: *Prophets* (photo: B. Beckett 2008).

remaining moisture would be sealed within the encaustic coating. He explained in meticulous detail the production of the plaster, which included the careful selection of lime and sand. With the addition of slag he created hydraulic lime plaster. Probably following the antique tradition, Fernbach recommended a multilayer plaster structure – even for his *secco* painting – similar to the ancient fresco technique with at least two rough *arriccio* layers and a fine *intonaco* (Fernbach 1845: 123).

After the preparation of the support, the painting process started by saturating the support with beeswax dissolved in rectified turpentine and then diluted with Venice turpentine. After this process, the mixture was melted into the plaster with a device designed by Fernbach. This implement, made of sheet iron, measured 9 × 14 in. (22.86 × 35.56 cm), and was loaded with burning coal. It was moved at a distance of two to three finger widths from the wall (Fernbach 1845: 164). It can be assumed that this device was inspired by the description of a similar apparatus in the report of de Caylus (Müntz 1760: 63). This heat treatment was repeated with the initial mixture, and then supplemented with an amber solution. Then the painting ground – consisting of white lead, chalk, poppy-seed oil varnish and a wax-amber solution – was applied with a bristle brush. The painting medium was a mixture of individually dissolved components: amber, natural rubber and bleached beeswax. The fossil resin amber was melted in a round-bottomed flask to form amber oil. The oil was dried and then ground to a powder that could be dissolved in turpentine. Fernbach dissolved the rubber in turpentine, not in the usual ether or benzene, using a complex process. For the painting, pigments were combined with this binding medium mixture and diluted with turpentine. To apply metal foil such as gold leaf, Fernbach added oil to the mixture. Finally the painting was coated with the wax mixture several times, but this time using older, harder beeswax. This coating was again burned in with his melting device filled with burning coal.

The conservation of the wall-painting in the chapel of Forchheim Castle by Fernbach

In 1830, during the early years of his research into encaustic painting, Fernbach was given the opportunity to demonstrate his newly developed technique with the restoration of the recently discovered medieval wall-paintings in the chapel of

Figure 2 Forchheim Castle, Chapel, north wall: *Adoration of the Magi* (photo: B. Beckett 2008).

Forchheim Castle. The castle was built in the last quarter of the fourteenth century by Prince-Bishop Lamprecht of Brunn (around 1320–1399), adviser to Emperor Charles IV and his son Wenzel IV. Three levels of walls were covered with secular and religious wall-paintings, depicting the educated and widely travelled Lamprecht of Brunn. The paintings, created by a team of painters, show regional parallels to the art in Nuremberg, as seen on the detached wall-painting fragment in St Sebald, dated 1379 to 1386, depicting the legend of the apostles. A further example is the wall-painting cycle in the former Dominican monastery of St Catherine (destroyed in World War II). These are similar to contemporaneous Italian, French and Bohemian artworks created in the international style at the end of the fourteenth century, such as the artworks in Karlstein Castle in Prague (Figs 1–3) (Schädler-Saub 2000: 80, 94, 130; Stein-Kecks 2007).

The painting technique also corresponded to that encountered in northern Europe in the fourteenth century. The paintings were executed in *secco* technique on polished lime plaster brushed with a layer of limewash, which functioned as a ground layer. On this priming, the fine painting was built up in several layers with opaque paint and several glazes with a tempera binding medium of protein and oil (Beckett 2010). The wall-paintings were covered with plaster at the turn of the seventeenth century and then lost to living memory until they were accidentally rediscovered in 1830. In the enthusiastic atmosphere of medieval revival and Romanticism, the excavations of Pompeii and Herculaneum and the subsequent search for the encaustic technique, this discovery caused great excitement. Fortunately, the entire conservation process was well documented in correspondence between King Louis I, his adviser Johann Georg von Dillis (1759–1841) and the painter Fernbach (Bavarian State Collections Archive 1830–34; Public Records Munich 1830–32; Public Records Coburg 1830–32; Goldberg 2002). Von Dillis, a painter, accompanied the young crown prince on his travels to Italy and Greece, sharing the king's passion for encaustic art. It was also von Dillis who encouraged Fernbach in his early studies.

The accidental discovery of the wall-paintings in Forchheim occurred in August 1830, when parts of the plaster fell off the wall. At that time, this once-important castle was used for storage and offices. Delighted by the discovery, an administration clerk continued to uncover the wall-paintings with a small hammer until two life-size figures were revealed. He was assisted in this by his wife and young daughter. The regional officer responsible for the castle was then notified, and a watercolour was sent to King Louis I to inform him about this outstanding find. The king asked the Central Gallery director, von Dillis, for his opinion on the newly discovered wall-paintings, as von Dillis was considered to be highest authority in Bavaria in this field at that time. Von Dillis confirmed the importance of the paintings and recommended that a coloured drawing be made of the find as an initial documentation. Without having seen the paintings, he recommended using the common method of cleaning with bread, assuming that the paint layer was stable. Influenced by the work undertaken with the earlier discovery of wall-paintings at Pompeii, von Dillis further proposed that detaching the wall-paintings together with the plaster (*stacco*) should be considered as a preventive conservation method. He was concerned that the paintings could suffer after exposure to the environment once the protective lime plaster was removed, as had happened to the murals in Pompeii after the removal of the covering lava (Dillis 1830). In the case that detaching the murals would not be necessary, he suggested other measures for preservation *in situ*: the insertion of windows and the order to air the room only in dry weather. Influenced by attempts to recreate the encaustic painting technique, von Dillis recommended a wax coating or using wax mixed with fig milk. Demonstrating a comprehensive approach, von Dillis sent a request to the national archive for documents relating to the history of the castle. He recommended the painter Fernbach to the king as the only person suitable for the application of such a wax coating. Subsequently, a royal decree was issued in 1831, commissioning Fernbach to varnish the murals. Despite being awarded the title of the Royal Conservator in 1837, this was his

Figure 3 Forchheim Castle, Study, east wall: *Human Crane (Kranichmensch)* (photo: B. Beckett 2008).

first and only restoration work. Up until this point, Fernbach's encaustic technique had only been carried out on small test panels, never on a large scale. Nevertheless, von Dillis allowed Fernbach to apply his painting technique for the first time over a large area. Fernbach himself wrote that 'he cannot help noting that these wall-paintings will be his first application of his encaustic technique on large scale and therefore some problems will have to be resolved' (Fernbach 1832a).

From the very beginning, there was speculation about whether the wall-paintings had been created with the encaustic technique. Before the start of the conservation work, Fernbach carried out simple analyses to establish the painting technique. For his first test, he extracted a small sample and dropped hydrochloride and nitric acid over it. There was no reaction with the paint layer, but the lime plaster dissolved with carbon dioxide formation. The resistance of the paint to the strong acids was, to Fernbach's conviction, an indication of the use of the encaustic technique. In a second test, he burnt a small sample in a glass tube. The smell of burnt organic material he interpreted again to be an indication of the encaustic technique. Finally, he heated a sample in a mixture of alcohol, potassium carbonate and rectified turpentine whereby the paint dissolved. Fernbach evaluated the results of this test as definite confirmation that the wall-paintings had been created in encaustic technique (Fernbach 1831; 1845: 284).

In his report to the Bavarian State Collections Board (Fernbach 1832b), Fernbach described the different stages of his conservation process. The first step was the removal of the covering plaster layer, which he described as easy because the plaster was primarily only attached to the wall by the plaster in the keyholes, which had been created before the covering plaster had been applied. Despite the effortless uncovering, Fernbach was convinced that some loss of the paint layer was unavoidable. After he dusted the surface with a brush and further cleaned it with bread, he filled the keyholes and larger losses in the plaster with lime mortar. He stated that only a few gaps in the paint layer had to be dabbed with new paint (however, a recent examination revealed that Fernbach overpainted the wall-paintings to a great extent). Finally, he covered the entire surface with a wax mixture and burnt it in with his burning coal device. He called his treatment encaustic restoration (Fig. 4).

Fernbach did not provide details of the binding medium for the repainting or for his encaustic wax mixture in his report, probably because he had to keep his encaustic technique secret at the king's request. Modern analyses of the binding medium in his paint show a natural resin. Analysis of residual encaustic mass on the surface has identified bleached beeswax, natural resin and protein (Beckett 2010). The protein is probably derived from a later consolidation with casein at the beginning of the twentieth century.

Fernbach commissioned a painter for the reconstruction of the lost drapery along the base zone. Paint bound with plant glue was used for this purpose. To create an aesthetic unity

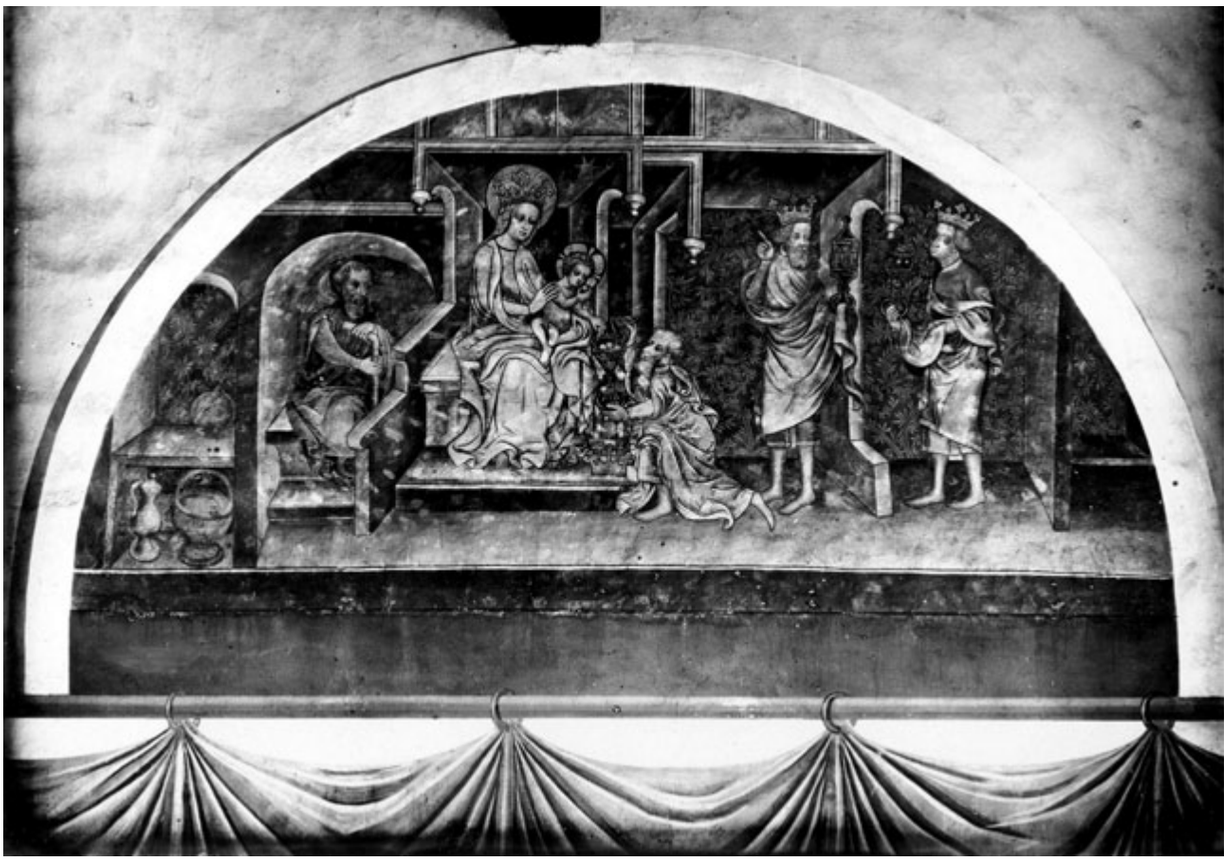

Figure 4 Forchheim Castle, Chapel, north wall: *Adoration of the Magi* after treatment by Franz Fernbach. An historical photograph from before the 1906–10 conservation showing the encaustic restoration of Franz Fernbach (State Archive Nuremberg, Germany: Signature A47/I KS-121/XV).

of the room, Fernbach reconstructed the fourth prophet that was lost with the exception of small fragments of the head and arm when a chimney opening was fitted into the west wall in the sixteenth century. In contrast to his overpainting of the original parts of the composition, he chose a more restrained approach on his reconstructed figure: in the area where the entire figurative painting had been lost, he indicated only the silhouette of the figure by retouching the background (Fig. 5). He assured von Dillis that he would be able to completely reconstruct the painted prophet because he studied the character of the painting, but he left the decision regarding the degree of completion to him (Fernbach 1832a). It can be assumed that this careful indication of the lost figure was the decision of von Dillis but his answer is not found in the surviving correspondence. Further reconstructions were also made by Fernbach on a newly built partition wall, separating the chapel from the adjacent study. He decorated these areas with a composition of floral motifs from wall-paintings with which he was familiar without implementing the floral motifs from the chapel's decoration. Fernbach suggested to von Dillis that a Latin inscription should be included praising Ludwig I as the patron of the encaustic painting technique. This was later reduced to an 'L' and a crown in memory of King Louis I. Because the few small areas that had been uncovered do not show the inscription, this is only known from the correspondence (Fig. 6). Modern analyses of the recreated decoration confirm that he used an oil-resin binding medium and no wax (Beckett 2010).

Fernbach admitted to several problems occurring during the encaustic coating procedure – mainly draughts and moisture, and fumes from the burning coals that were making him ill. However, despite this, he finished in March 1832 after only five months of work. Fernbach's restoration elicited a controversial response from experts. Von Dillis thought that Fernbach had completed the work professionally and applied appropriate measures to preserve these remarkable wall-paintings. However, the work was sharply criticised by the restorer from the museum in Bamberg, Karl Mattenheimer (1791–1853). In a letter to von Dillis, he expressed his opinion that, after having seen one of the finished paintings, he thought the restoration had failed, and Fernbach had violated the duty of a restorer to respect historic monuments. He stated that Fernbach had damaged the wall-paintings during the uncovering and afterwards overpainted them extensively (Mattenheimer 1832).

Following the conservation treatment, interest in the wall-paintings of Forchheim Castle waned with the exception of a few art-historical publications. There was no attempt to uncover additional wall-paintings that were known to be lying under the plaster in other rooms. After Fernbach had demonstrated with his restoration at Forchheim Castle that his encaustic technique could be applied to large-size murals, the focus shifted from a possible restoration technique to employing it as a painting technique in the decoration of the king's new buildings in Munich.

Figure 5 Forchheim Castle, Chapel, west wall: *Prophets* after treatment by Franz Fernbach. An historical photograph from before the 1906–10 conservation showing the encaustic restoration of Franz Fernbach (State Archive Nuremberg, Germany: Signature A 47/I KS-121/XV).

Conservation of the wall-paintings 1906–1910

More than 70 years later, at the beginning of the twentieth century, after a long period of neglect, Forchheim Castle was once again the focus of a conservation project. During the conversion of the building to a museum, wall-paintings were uncovered in further rooms. There had been a radical change in the ethics of conservation around 1900, shifting towards a modern, scientific process. This was outlined in the well-known writings of the art historians Georg Dehio (1850–1932) (Dehio 1901, 1905) and Alois Riegl (1858–1905) (Riegl 1903; Forster 1982; Bacher 1995; Hubel 2005). Therefore, the preservation of the remaining wall-paintings without interpretation had been the main aim of this conservation. After they were uncovered, the wall-paintings were partially consolidated with a thin casein solution and then presented as fragments with very little retouching. Larger lacunae were filled with lime plaster toned with a monochrome thin casein glaze (Fig. 7).

The general conservator for the care of monuments of Bavaria (*Generalkonservator*), Hugo Graf (1844–1914), specified that the wall-paintings restored by Fernbach should be re-treated because, in his opinion, Fernbach's work had devalued the historic artworks considerably. Therefore, Fernbach's encaustic additions had to be removed. Because of concerns that some details in the painting could be lost with the removal of the overpainting, or had already been lost prior to being overpainted, Graf commissioned colour copies of the

Figure 6 Forchheim Castle, Chapel, south wall: wall-painting by Franz Fernbach 1830–32 (photo: B. Beckett 2001).

Figure 7 Forchheim Castle, Great Hall, east wall: *King David* (photo: B. Beckett 2008).

paintings (Graf 1907). In all likelihood, only pencil drawings on tracing paper in a scale of 1:1 were made before the removal of the overpainting (Fig. 8).

After Graf retired in March 1907, his successor, Georg Hager (1863–1941), advanced the preservation of wall-paintings by advocating the modern principle of conservation instead of restoration[7] (Wohlleben 1988: 98). Hager implemented his ideas in guidelines for the conservation of wall-paintings in 1903 (Hager 1909, 1913). In this spirit, the artist Friedrich Pfleiderer from Munich, who had already carried out several conservations of wall-paintings with this new, restrained approach, was recommended for the work at Forchheim Castle. Following the initial specifications of Hugo Graf, the encaustic wax impregnation and overpainting of Fernbach were removed with hot turpentine, the newly designed paintings by Fernbach on the south wall of the chapel were covered with whitewash, and the drapery that had been repainted with plant glue was removed by washing with water. Because the wax was deeply burned into the medieval painting, it was not possible to remove it completely.

The correspondence that exists between the supervising conservators from the Bavarian State Conservation Office (1906–11) and the responsible restorer does not include any discussion or objection regarding the removal of the additions made by Fernbach during the encaustic restoration. This historical restoration was not yet seen as an important example of the restoration process of that time.

Wax as a material for the conservation of wall-paintings as a result of a recreation of the encaustic technique

The uncritical euphoria at the beginning of the nineteenth century, with the rapid implementation of various new encaustic mixtures and technologies for new paintings, was followed by a critical assessment regarding its ease in application and stability. Damage, such as flaking and blanching of the paint layer, soon appeared, especially on exterior murals. This led to a reversion to the *fresco* technique and the use of the newly developed silicate paint, the Keim mineral painting technique.[8]

Despite being much admired, mainly because of his publications, Fernbach's encaustic technique was only used on a few paintings in Munich, in the *Königsbau* of the Neu Residenz, an exterior painting on the gable of the Royal Theatre, and the first two paintings of the 23 scenes of the *Landscapes of Greece* by Carl Rottmann (1797–1850) in the New Pinakothek (Rott *et al.* 2007). Because of ease of application, Rottmann used the technique of resin painting developed by Friedrich Knirim (Knirim 1839), with balsam copaiva instead of amber, for the remaining 21 paintings. Gradually, Rottmann developed the technique, and for the later panels of the Greece cycle he used a dammar wax mixture (Rott *et al.* 2007: 71). The use of the brittle resin amber made Fernbach's paint susceptible to flaking and his complicated procedure for the preparation and application of the paint was too restrictive for the artists.

In the middle of the nineteenth century, there was a decline in interest in the encaustic technique for the creation of new artwork. Research focused again on analyses of the painting techniques of the Roman-Campanian wall-paintings, but this time without the emotionally charged euphoria of rediscovering the ancient encaustic technique. Observations and analyses could now be evaluated objectively. Early evidence that the paintings had been carried out *a fresco*, such as that provided by the German painter Raphael Mengs (1728–1779), who stayed in Naples and Rome several times to study the antiquities, was re-examined. In addition, the analyses published in 1809 by the French chemist Jean Antoine Chaptal (1756–1832) that did not find any wax in excavated paint pots from Pompei were now acknowledged (Donner 1869: 5). However, wax, which was the main component in the encaustic technique, had by then been introduced as a material in the conservation of wall-paintings and stonework. Its durability was considered to be advantageous when applied to the task of preservation of artworks. In the late eighteenth century, at the beginning of the excavation of Pompeii, the newly uncovered murals were treated with various varnishes to stop rapid disintegration of the paint layer after it was exposed to the atmosphere. Another aim of the coatings was to retain the vibrant colours of the paintings and preserve how they appeared immediately after excavation when they still contained moisture from the earth. In those early days, in addition to gum arabic, a mixture composed by Stefano Moriconi was widely in use. Its main components were spike oil, copal, gum elemi, sandarac and amber dissolved in ethanol (Cagiano de Azevedo 1950: 40; Moormann 1991: 95). As part of the encaustic debate, tests were soon carried out to treat the surface of the Roman wall-paintings with hot wax, which seemed to have positive properties in terms of consolidation. De Caylus wrote that, after being applied, wax does not flake because it remains flexible; it cannot be damaged by heat; does not change with age; is even stronger than the *fresco* technique; resists moisture and exposure to the air; and does not bind dust in the same way as a binding medium containing oil (Knirim 1839: 178). In addition to the desired water repellence, wax resulted in a colour enhancement that corresponded with the apparent intense colours of the still slightly moist wall-paintings after initial excavation. Soon, wax became a popular consolidant and protective coating for murals throughout Europe. In the cathedral of Pisa in 1836, the restorer came into conflict with the curator of the Campo Santo because he used casein instead of wax. For the restoration of the famous frescoes of the Florentine painter Benozzo Gozzoli (1420–1497) in 1857, instructions were given to use wax for consolidation and as a varnish. The decision was assessed by the members of a committee from the Academy of Pisa, which was responsible for the restoration work in the Campo Santo. They pointed out that the wax would change the character and colour of the paintings, especially of the frescoes, but that its use was nevertheless essential to preserve the composition (Conti 2007: 289). In the third quarter of the nineteenth century, criticism of the use of wax increased. In 1866, Giovanni Secco Suardo (1798–1873) published his important *Manual for the Technique of the Conservation of Paintings* (Achsel 2012). He strongly advised against the use of wax for the consolidation of frescoes, suggesting instead that a paraffin solution with a small amount of amber could be applied (Achsel 2012: 640). The use of paraffin had already been described for the impregnation of Baroque wall-paintings in the Munich Bürgersaalkirche, in 1862 (Schießl 1987: 168). The use of wax in Germany was widely replaced by casein, but until the beginning of the twentieth century there were still sporadic recommendations for the use of wax. The use of a wax solution is documented in the medieval wall-paintings in St Sebald in Nuremberg, treated in 1903 (Schädler-Saub 2000: 58).

Figure 8 Forchheim Castle, Study, east wall: *Fantasy Creature*, pencil drawing on tracing paper executed during the conservation of 1906–1910 (photo: B. Beckett 2000).

In England, wax was used more extensively and longer, until the middle of the twentieth century. In 1883, Arthur Herbert Church (1834–1915), a chemistry professor at the Royal Academy of Arts in London, recommended a mixture of bleached beeswax and copal varnish in turpentine as a preservative and protective coating for wall-paintings (Cather and Howard 1986: 50). This led to the systematic treatment of most medieval wall-paintings with wax solutions in England. Evidence of the damage caused by the reduction of porosity and the embedding of dirt was largely ignored. It was not until 1950 that an official report from the Council for the Care of Churches questioned the application of wax and requested a ban (Central Council for the Care of Churches 1959: 12; Cather and Howard 1986: 51).

Conclusion

The history of the conservation of the medieval wall-paintings in the castle of Forchheim is a prime example of the complexity of the conservation movement in the nineteenth century. The great excitement arising from the excavations of Herculaneum and Pompeii was an important boost for conservation, especially of wall-paintings. Chemical analyses were performed on objects that were being treated, and research of historic sources and materials and painting techniques was being carried out all over Europe. Stimulated by the desire to discover and recreate the encaustic painting technique of antiquity, new paint mixtures were designed for numerous new murals in Germany in an attempt to recreate a durable painting technique similar

to the encaustic of Roman times. As a result of this search for an encaustic paint, wax was introduced into the conservation of wall-paintings for consolidation and as a varnish. A very early example of a wax mixture used in a conservation operation was the case of the newly discovered wall-paintings in the chapel in Forchheim, which were treated in 1830–32 by Franz Fernbach, a leading name in the recreation of the encaustic technique in Munich. He applied his own encaustic painting technique in the overpainting and varnishing process. The surviving correspondence between King Louis I, Georg von Dillis and Franz Fernbach demonstrates mixed motives behind the use of a wax technique: a desire to preserve the valuable paintings but also a passion and curiosity to test new materials and techniques. By the mid-nineteenth century the short and intensive use of the newly developed encaustic paint had declined, but the use of wax in conservation remained until the end of the nineteenth century, and, in England, until the 1950s.

The case study of Fernbach's conservation of the wall-painting in Forchheim Castle is interesting as it shows a crossover between two fields that were closely related in the nineteenth century – the creation of new works of art and the restoration of older paintings. The wall-painting in Forchheim was, in effect, a test object for implementation of the encaustic technique on a large scale for the creation of new works of art. The conservation measures using encaustic, however, were not done as a random treatment but were founded in the belief that an organic binding medium had been used originally. Opinions regarding the suitability of encaustic media for this operation were certainly coloured by the intense and emotional atmosphere surrounding the discoveries of ancient wall-paintings and the efforts to develop wax-based painting techniques. It is unfortunate that one of the only examples where the encaustic technique was used in conservation was not preserved. In common with countless other paintings it fell victim to changing ideals and requirements both regarding conservation materials and aesthetic presentation.

Notes

1. The dates vary because there was a gap between the first findings until the start of systematic excavations.
2. Marcus Vitruvius Pollio (*c*.84–20/10 BC), the author of the *De architectura*, was a Roman architect, art historian and engineer in military and hydraulic construction. The book was rediscovered in the fifteenth century. In Volume VII, Chapter 6, Vitruvius described the production of lime mortar with the addition of crushed, translucent marble powders to increase the gloss in the final smoothing of the surface. In Chapter 9 he discussed cinnabar and the technique by which its deterioration could be prevented: after the paint was dry, punic wax (melted with a little oil) was applied using a cloth and then polished to prevent blackening of the pigment. Vitruvius also recommended this treatment with a wax oil for protecting marble statues.
3. Gaius Plinius Secundus (AD 23–79), better known as Pliny the Elder, Roman naturalist, naval and army commander and author of the encyclopaedia *Naturalis historia*. In Volume XXXV, Chapter 41, Pliny wrote about painting, stating that wax was used for paintings and for the decoration of warships. In Chapter 31 he emphasised that wax was not used for the decoration of walls.
4. Fuchs used the name stereochromy in his 1855 publication. The word is derived from the Greek *stereos*, meaning strong, durable, and *chroma*, meaning paint (Hoppe 1995: 2).
5. Pettenkofer, a chemist and hygienist, published *Über Ölfarbe und Conservirung der Gemälde-Gallerien durch das Regenerations-Verfahren* (*About Oil Painting and the Conservation of Picture Galleries by the Regeneration Method*) in Munich in 1870.
6. Müntz (1727–1798), anglicised as John Henry Muntz, was a German-Swiss painter and architect who worked all over Europe and created works in the style of the Gothic Revival with the support of Count Horace Walpole.
7. The often repeated slogan 'conservation instead of restoration' is taken from the speech 'Denkmalschutz und Denkmalpflege im 19. Jahrhundert' ('Protection of Historic Monuments and Preservation of Cultural Heritage in the Nineteenth Century') that Dehio gave in honour of the emperor's birthday in Strasburg in 1905. Therein Dehio drew attention to the destruction of monuments and artworks through incorrect restoration. In the nineteenth century, the word 'restoration' was used in the sense of reconstruction. Dehio's short slogan is still used nowadays, even though the definition of restoration has changed and now only denotes aesthetic reintegration to 're-establish' the aesthetic and historic value of the painting (Petzet 2004).
8. In 1878, Adolf Wilhelm Keim (1851–1913) patented his *Mineral-Malerei*, consisting of potassium water glass, inorganic pigments and fillers (Hoppe 1995).

References

Achsel, B. 2012. *Das Manuale von Giovanni Secco Suardo von 1866/1894, Ein Schlüsselwerk zum Verständnis der Restaurierungsgeschichte des 19. Jahrhunderts (Kommentierte Übersetzung).* Göttingen: V&R unipress.

Bacher, E. 1995. *Kunstwerk oder Denkmal? Alois Riegls Schriften zur Denkmalpflege*. Vienna/ Cologne/ Weimar: Böhlau Verlag.

Bavarian State Collections Archive 1830–34. XIV, F,1 file: *Akte: Erhaltung alter Wandgemälde im Schlosse zu Forchheim 1830–[1834])/ Conservation of the Historic Wall Paintings in the Castle of Forchheim 1830–[1834]*.

Bavarian State Conservation Office Archive 1906–11. File, *Akte: Forchheim Schloss Wandmalerei Restaurierung/ Forchheim Castle Wallpaintings Restoration*.

Beckett, B. 2010. Unpublished report on the FTIR Analysis, Laboratory Drewello and Weissmann, Bamberg, Germany.

Cagiano de Azevedo, M. 1950. 'Vernici settecentesche sulle pitture di Ercolano e Pompei', *Bollettino dell´ Istituto Centrale del Restauro* 1: 40–41.

Cather, S. and Howard, H. 1986. 'The use of wax and wax-resin preservatives on English mediaeval wall paintings: rationale and consequences'. In *Case Studies in the Conservation of Stone and Wall Paintings*, N.S. Bromelle and P. Smith (ed.), 48–54. London: IIC.

Central Council for the Care of Churches 1959. *The Conservation of English Wallpaintings*. Aberdeen: Central Council for the Care of Churches.

Conti, A. 2007. *History of the Restoration and Conservation of Works of Art*, H. Glanville (trans.). Oxford: Elsevier.

Dehio, G. 1901. 'Was wird aus dem Heidelberger Schloß werden?'/ 'What shall become of the Heidelberg Castle?'. In *Dehio, Georg, Riegl, Alois: Konservieren nicht restaurieren, Streitschriften zur Denkmalpflege um 1900*, M. Wohlleben (ed.) 34–42. Braunschweig/ Wiesbaden: Fried. Vieweg & Sohn.

Dehio, G. 1905. 'Denkmalschutz und Denkmalpflege im neunzehnten Jahrhundert'/ 'Protection of historical monuments and care of monuments in the 19th century'. In *Dehio, Georg,*

Riegl, Alois: Konservieren nicht restaurieren, Streitschriften zur Denkmalpflege um 1900, M. Wohlleben (ed.), 88–103. Braunschweig/ Wiesbaden: Fried. Vieweg & Sohn.

Dillis, J. von 1830. Letter to King Louis I, dated 17 September 1830, Bavarian State Collections Archive, XIV, F, 1 file: *Akte: Erhaltung alter Wandgemälde im Schlosse zu Forchheim 1830–[1834]*)/ *Conservation of the Historic Wall Paintings in the Castle of Forchheim 1830–[1834]*.

Donner, O. 1869. *Die erhaltenen antiken Wandmalereien in technischer Beziehung*. Leipzig: Breitkopf und Härtel.

Fernbach, F. 1831. Report to the Bavarian State Collections board, dated 12 October 1831, Bavarian State Collections Archive, XIV, F,1 file: *Akte: Erhaltung alter Wandgemälde im Schlosse zu Forchheim 1830–[1834]*)/ *Conservation of the Historic Wall Paintings in the Castle of Forchheim 1830–[1834]*.

Fernbach, F. 1832a. Report to the Bavarian State Collections board, dated 25 January 1832, Bavarian State Collections Archive, XIV, F,1 file: *Akte: Erhaltung alter Wandgemälde im Schlosse zu Forchheim 1830–[1834]*)/ *Conservation of the Historic Wall Paintings in the Castle of Forchheim 1830–[1834]*.

Fernbach, F. 1832b. Report to the Bavarian State Collections board, dated 3 April 1832, Bavarian State Collections Archive, XIV, F,1 file: *Akte: Erhaltung alter Wandgemälde im Schlosse zu Forchheim 1830–[1834]*)/ *Conservation of the Historic Wall Paintings in the Castle of Forchheim 1830–[1834]*.

Fernbach, F. 1834. *Ueber Kenntniss und Behandlung der Oehl-Farben*. Munich: Weber.

Fernbach, F. 1843. *Die Oelmalerei*. Munich: Verlag der literarisch-artistischen Anstalt.

Fernbach, F. 1845. *Die Enkaustische Malerei ein Lehr- und Handbuch für Künstler und Kunstfreunde.* Munich: Verlag der literarisch-artistischen Anstalt.

Forster, K. (ed.). 1982. 'Alois Riegl: the modern cult of moments: its character and its origin', *Opposition: A Journal for Ideas and Criticism in Architecture* 25: 21–44.

Goldberg, G. 2002. 'Durch diesen glücklichen Fund waren namentlich die Frau und Fräulein Tochter des Herrn Rentbeamten so aufgeregt ... Die Archivalien der Alten Pinakothek zu den Wandgemälden der Forchheimer "Kaiserpfalz"', *Bericht des Historischen Vereins für die Pflege der Geschichte des ehemaligen Fürstbistums Bamberg* 138: 205–37.

Graf, H. 1907: Letter to the Historic Society Forchheim, dated 8 February 1907. Bavarian State Conservation Office Archive: File, No 738 (3) *Akte: Forchheim Schloss Wandmalerei Restaurierung/ Forchheim Castle Wallpaintings Restoration 1906–11*.

Hager, G. 1909. *Heimatkunst, Klosterstudien, Denkmalpflege. Gesammelte Aufsätze.* Munich: Rieger Verlag.

Hager, G. 1913. 'Die Erhaltung und Restaurierung alter Wandmalereien'. In *Vierter Tag für Denkmalpflege, Erfurt, Stenografischer Bericht*, 1913: *Denkmalpflege, Auszug aus den Stenographischen Berichten des Tages für Denkmalpflege*, vol. II, A. von Oechelhaeuser (ed.), 268–81. Leipzig: Seemann.

Hoppe, T. (ed.) 1995. *Adolf Wilhelm Keim: Die Mineral- Malerei Neue Verfahren zur Herstellung witterungsgeständiger Wandgemälde Technisch wissenschaftliche Anleitung*. Stuttgart: Ferdinand Enke Verlag (repr. of 1881 edn).

Hubel, A. 2005. 'Der Generalkonservator Alois Riegl. Verdichtung des Denkmalbegriffs durch die Erfahrungen in der Praxis'. In *Kunstgeschichte und Denkmalpflege*, A. Fink, C. Hartleitner-Wenig and J. Reiche (eds), 217–30. Petersberg: Imhof Verlag.

Knirim, F. 1839. *Die Harzmalerei der Alten*. Leipzig: Friedrich Fleischer.

Marggraff, R. 1840. 'Üeber die neue entkaustische Malerei in München und deren Stellung zu anderen Ausübungsarten der Malerei in älterer und neuerer Zeit. Ein Beitrag zur Geschichte der Malertechnik unserer Tage', *Münchner Jahrbücher für bildende Kunst* 1: 225–65.

Mattenheimer, C. 1832. Letter to Johann Georg von Dillis, dated 30 January 1832, Bavarian State Collections Archive, XIV, F,1 file: *Akte: Erhaltung alter Wandgemälde im Schlosse zu Forchheim 1830–[1834]*)/ *Conservation of the Historic Wall Paintings in the Castle of Forchheim 1830–[1834]*.

Moormann, E. 1991. 'Destruction and restoration of Campanian mural paintings in the eighteenth and nineteenth centuries'. In *The Conservation of Wall Paintings*, S. Cather (ed.), 87–102. Singapore: Tien Wah Press, Ltd.

Müntz, J.H. 1760. *Encaustic or, Count Caylus's Method of Painting in the Manner of the Ancients*. London: Bible and Crown near Chancery Lane.

Petzet, M. 2004. 'Principles of preservation: an introduction to the international charters for conservation and restoration 40 Years after the Venice Charter'. In *International Charters for Conservation and Restoration*, 2nd edn, 7–29, ICOMOS. Munich: Lipp GmbH.

Public Records Coburg 1830–32. K 216 II Nr. 723, files: Finance Office (*Akten: Forchheim Finanzamt Forchheim*).

Public Records Munich 1830–32. MInn 24107, file: *Die alten Wandgemälde im Schlosse zu Vorchheim [Forchheim]/ The Historic Wallpaintings in the Castle of Forchheim*.

Riegl, A. 1903. 'Der moderne Denkmalskultus, sein Wesen und seine Entstehung'. In *Dehio, Georg, Riegl, Alois: Konservieren nicht restaurieren, Streitschriften zur Denkmalpflege um 1900*, M. Wohlleben (ed.), 43–87. Braunschweig/ Wiesbaden: Fried. Vieweg & Sohn.

Rott, H., Poggendorf, R. and Stürmer, E. 2007. *Carl Rottmann, Die Landschaften Griechenlands*, Bayerische Staatsgemäldesammlungen (ed.). Ostfildern: Hatje Cantz Verlag.

Schädler-Saub, U. 2000. *Gotische Wandmalereien in Mittelfranken*, Arbeitsheft, Bayerischen Landesamtes für Denkmalpflege 109. Munich: Karl M. Lipp Verlag.

Schießl, U. 1987. 'Apage Satanas! Apage Copaiva! Über Materialmethoden in der Restaurierungsgeschichte', *Zeitschrift für Kunsttechnologie und Konservierung* 1(1):165–75.

Stein-Kecks, H. 2007. 'Forchheim im Kontext der spätgotischen Wandmalerei'. In *Die Wandmalereien in der Kaiserpfalz Forchheim*, e.V. Förderkreis Kaiserpfalz (ed.), 47–67. Forchheim: F.A.Streit.

Wohlleben, M. (ed.) 1988. *Dehio, Georg, Riegl, Alois: Konservieren nicht restaurieren, Streitschriften zur Denkmalpflege um 1900*. Braunschweig/ Wiesbaden: Fried. Vieweg & Sohn.

Author's address

Barbara Beckett (barbaraalosiabeckett@gmail.com)