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Expression and Sensibility. Art Technological Sources and the Rise of Modernism

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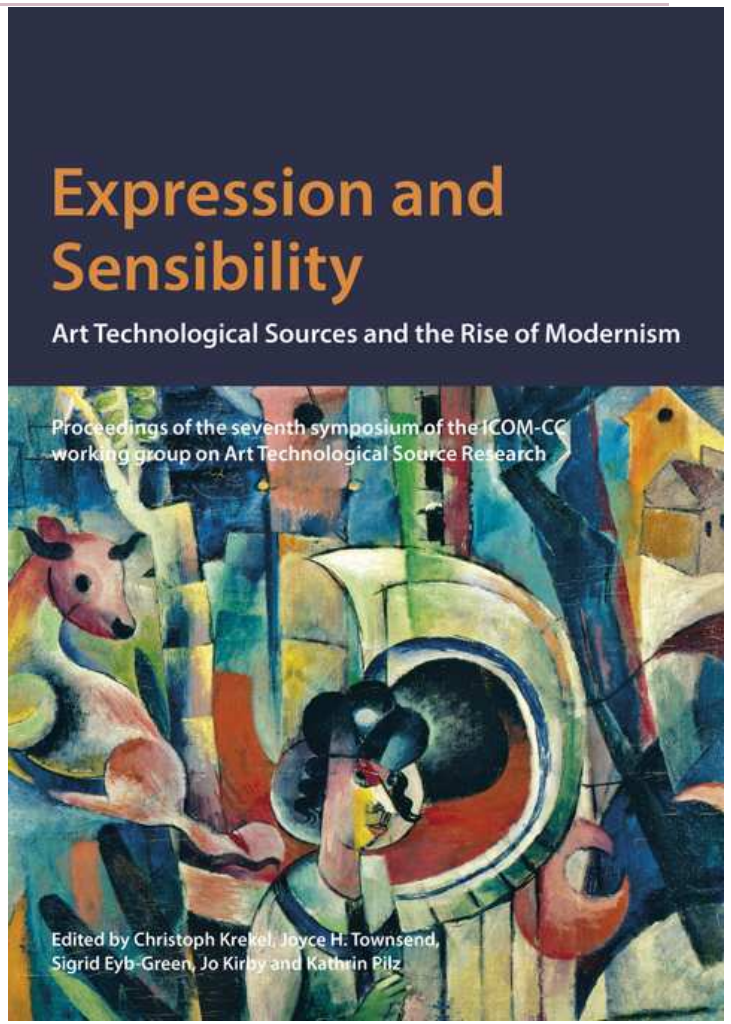

The period between 1850 and 1940 is characterised by completely new artistic ideas and concepts as well as the introduction of many new products such as tubes of oil, tempera-based paints, synthetic organic pigments etc. offered by artists' colourmen, and industrial product ranges including metallic pigments. Some artists – often unfamiliar with the technical properties and qualities of ready-made products – reacted to these developments by introducing innovative artistic techniques while others reintroduced technical concepts that were considered obsolete by established institutions, or originated from non-European civilisations. There was a revival of interest in medieval and antique art technological sources, and German paint technologists in particular became involved with artists' materials, their use and studies of their material properties.

Diego Rivera's revival of encaustic painting: the use of wax in Mexican avant-garde painting

Sandra Zetina

ABSTRACT In 1921 Diego Rivera travelled through Italy to study Renaissance, Byzantine and ancient Roman mural paintings and mosaics. Back in Mexico, he was commissioned by the Ministry of Education to paint murals on the walls of the National Preparatory School. Trying to recover some of the optical advantages and the aura of the encaustic technique, Rivera used this material to paint *La Creación* based on his study of the colour used in Eugène Delacroix's paintings in Saint Sulpice, Paris. Likewise, Gerardo Murillo, better known as 'Dr Atl', created a type of solid oil crayon, the *Atl-colours*, which were made from a mixture of waxes and resins similar to those used for the encaustic technique. This paper discusses ideas on the encaustic technique found in the manuals and treatises used by Diego Rivera: the pharmacist A.M. Duroziez (1838), Jacques-Nicolas Paillot de Montabert (1829), the treatise written by Rivera and Juan O'Gorman, *Sobre la encáustica y el fresco* (1951), and notes in periodicals and contemporary art criticism. This research explores the manufacture and experimentation with mixtures of wax, resins and oil in a selection of mural paintings executed during the first decades of the 20th century. The leading encaustic practices by Rivera are compared with the use of this medium in murals of other Mexican avant-garde artists. The interest in the revival of the techniques of antiquity prompted a reinterpretation of Mexican pre-Hispanic paint media and charged some materials with symbolic connotations. For instance, the use of copal in encaustic and *Atl-colour* crayons was referred to as a Mexican contribution to the technique.

The Mexican return to craftsmanship: from academia to avant-garde

In 1922, Diego Rivera (1886–1957) declared that he had recovered the original encaustic technique 'for the first time since antiquity' (del Sena 1922; Ortega 1923). At the National Preparatory School he was finishing his first mural, *La Creación* (*The Creation*), a painting that would become the point of departure of the mural movement. This 'revival' of the encaustic medium generated immediate enthusiasm among the group of younger avant-garde painters who subsequently produced encaustic murals: Jean Charlot (1898–1979), Fermín Revueltas (1901–1935), Fernando Leal (1901–1935) and David Alfaro Siqueiros (1896–1974). Although use of the encaustic technique proved to be only a short-term phenomenon among the Mexican avant-garde, many of the artists involved in this intense experiment learned how to paint with raw materials, rediscovered or reinvented ancient techniques, and in general engaged with new painting methods in a similar fashion to the Italian *ritorno al mestiere* (return to order) (de Chirico 1919; Vacanti 2006).

This research aims to clarify Rivera's interest in the encaustic medium, the written sources that he used, as well as research and development of this painting technique in Mexico. It focuses on the selection of encaustic by Rivera as well as the connotations that he attributed to the medium. It also examines some of his sources and intentions, the consequences of the use of encaustic for the images he produced, and the reception of the murals by artists and laypeople, particularly the impact on contemporary painters.

The Mexican mural movement emerged from the ambitious cultural and educational programme that José Vasconcelos (1882–1959), prominent philosopher and minister of education in Mexico, designed with the aim of boosting literacy in a massive population. At the same time, Vasconcelos encouraged the cultivation and diffusion of the arts in general by launching unprecedented initiatives in publishing and the visual and performing arts that reached all regions of the country. This unique Mexican post-revolutionary cultural project spearheaded by Vasconcelos was in large part inspired by the programme developed in the USSR by Anatoly Lunacharsky (1875–1933) (Fell 2009). Young artists were part of the revolutionary cultural movement: their search for a utopian art led them to create works that integrated classical and local styles, incorporating shapes and subjects that appealed to the working class. The artistic medium became especially relevant. Among other artistic media, such as prints or books, artists privileged mural painting because it was conceptualised as a revolutionary medium that could reach huge illiterate audiences and thus attain collective appreciation, in contrast to easel painting which was destined for individual reception in bourgeois domestic spaces. Thus, intellectuals and artists aspired to reach a popular audience with the aim of constructing revolutionary images. Murals as an artistic medium offered possibilities of monumentality that suited the expectations

Figure 1 Diego Rivera, *La Creación* (*The Creation*), 1922–1923, gold and encaustic over concrete, 7.08 × 12.19 m (90 m²), Anfiteatro Simón Bolívar, Antiguo Colegio de San Ildefonso, Mexico City. (Photo © Bob Schalkwijk/© Banco de México Diego Rivera and Frida Kahlo Museums Trust/Artists Rights Society)

of the new country, and also promised material permanence and unlimited didactic potential. Charlot defined the experience of participating in the mural cycle at the National Preparatory School as if he had 'assisted at the birth of a national style', comparing that moment with the 'birth of a volcano' (Charlot 1967: vii).

The process of creating the very first murals was challenging and problematic: artists were not trained in mural painting techniques and a heated debate surrounded the subject. At the turn of the century, Mexican painters had received little education on materials and processes; prefabricated commercial artistic materials had entered the market several decades before and few artists were interested in preparing their own materials.

Both Rivera's peers as well as younger artists who had studied at the Mexican Academy had scant knowledge regarding the grinding of pigments and preparation of mediums – they were trained in easel painting using commercially prepared materials. Moreover, these artists did not have the technical knowledge required for mural painting and many lacked craftsmanship. As a result, having been given mural commissions, painters put all their creativity and intelligence into learning, inventing and reinterpreting mural painting techniques through research and gruelling trial and error that gave them experience in grinding pigments, melting materials, producing different types of mortar, and appreciating surface effects acquired as traces of the processes. It is not surprising, therefore, that these murals have a particularly experimental quality. Charlot, as a participant in this historical turning point, considered them to be an important departure: 'Those few [murals] that remain intact show limitations, hesitations, and technical *faux pas*, mixed with no little juvenile bluster. Yet the vast output of murals painted since then, and often by the same men, only rarely outclass these trial pieces' (Charlot 1967: vii–viii).

La Creación: wax from antiquity, indigenous tones and constructivist composition

Rivera began the encaustic mural around the early part of 1922 and it was inaugurated in March 1923. He carefully projected *La Creación* (Fig. 1) to produce an avant-garde classicism in which the medium and the facture actively participate in the image: the wax medium and the gold leaf create a celestial atmosphere that contrasts with the 'constructivist' composition in the style of Cézanne, the volumes built upon a mingling of Cubist strategies and the geometry of the golden ratio. The constructivist composition appears as if built on rock, as a result of the aesthetic and technical decision to chisel round all the contours. Rivera explained that he adopted an incised method for drawing 'firstly, to prevent the colours from dripping, and secondly, because the incised drawing has a more architectural character than the traced drawing'[1] (del Sena 1922: 47); thus, it is a method aimed at emphasising geometric design and the materiality of the encaustic medium.

Rivera accomplished a composition with traces of Cubism, but at the same time it evokes the classical design and the surface quality of Byzantine mosaics. The gigantic figures deploy a classic iconography: Adam and Eve are found on the ground, the lowest level of creation, and are in dialogue with the nine muses that are still in the earthly realm; floating on a cloud are the seven virtues. All the allegorical figures frame the primal energy, a blue cosmic sphere with golden stars and a rainbow, deployed in the manner of the Byzantine mosaics of Ravenna. Below, a man frontally depicted with opened arms emerges from a tropical forest surrounded by a Christian tetramorph: the man, the lion, the eagle and the ox, as well as an invented Mexican one inspired by the tropical regions of the country.

Rivera placed great emphasis on the painting process, stressing the relationship between encaustic and the classical tradition. In January 1923 he stated that he produced the

Figure 2 Diego Rivera descending the staircase, *c.*1922, The Jean Charlot Foundation, University of Hawaii.

Figure 3 Comparison of a sketch by Diego Rivera and the San Zeno Basilica murals. Left: *Saint Christopher*, *c.*13th century, mural painting, Basilica di San Zeno, Verona, Italy. (Image: Sandra Zetina) Right: Diego Rivera, sketch of San Zeno Basilica interior, pencil on paper, 20 × 10.5 cm, Italy, *c.*1920–21, The Jean Charlot Foundation, University of Hawaii. (Image © Banco de México Diego Rivera and Frida Kahlo Museums Trust/Artists Rights Society)

encaustic 'with the same pure elements and the same process employed in Greece and in Italy in Antiquity, this procedure, that the author restored through his own effort, thanks to the research conducted throughout ten years or so, is the most solid of the painting procedures, excluding the fired enamel' (Rivera 1923: 42).[2] In an interview he even suggested that the classical murals in Greece and Pompeii were primarily encaustic, and presented the medium as more durable than fresco: 'I decided upon this technique because it outlasts *fresco*, though the latter remains ideal for decoration and painting. In Pompeii and in Greece, not a single *fresco* is left standing. I went to Greece specifically to study the technique'[3] (del Sena 1922: 26).

The painting process was very long. An iconic photograph portrays Rivera in the middle of the process of experimentation: he is descending from the scaffolding, and the wall is covered with trials (Fig. 2). Rivera had just arrived in Mexico after a long trip to Italy to study murals, their technique, composition and proportions. At the Saint Christopher at the Basilica of San Zeno, in Verona, Rivera depicted the size of the figures in relation to the architecture and the human scale (Fig. 3); he used the same idea of monumentality in *La Creación*.

Rivera, commonly a fast and productive painter, worked for more than a year on *La Creación* with the help of four skilled assistants: the painters Carlos Mérida, Xavier Guerrero, Amado de la Cueva and Charlot. It should be noted that the mural is relatively small: 7 × 12 m.[4] In this confined room artists became craftsmen, painting practices and political ideas equated painters with labourers, which led on to the formation of a union. Rivera established an intense relationship with his colleagues and assistants, the enclosed space of *La Creación* functioning as a collective workshop. Rivera used secrecy and competition, and spread misleading notions about technique to foster rivalry among artists. The controversy, which lasted for a long time, was continuously revisited in the subsequent narratives published by the participants (Rodriguez 1949; Rivera and O'Gorman 1951; Alfaro Siqueiros 1951; Charlot 1967; Leal 1991).

Rivera's treatise on encaustic painting and his invention of encaustic

Rivera described the process of creating his first mural and his technical decisions to his follower, the architect and painter Juan O'Gorman. Rivera's memories and thoughts produced a conference that was turned into a little book called *Sobre la encáustica y el fresco* (*About Encaustic and Fresco*) and published several times (Rivera and O'Gorman 1951, 1954, 1993). In this book Rivera declared that without a doubt in *La Creación* 'true encaustic painting was restored for the first time since the Greek and Roman antiquity' (Rivera and O'Gorman 1993: 19), referring to the recovery of the process of 'true' encaustic, which he considered to be a process finished with fire. Rivera was aware of the diversity of the process and its aristocratic roots: he dedicated most of the text to discussing his sources and experiments, going on to describe the chronological and geographical roots of the method and finally the procedure that he employed in 1922–23. He used only one paragraph to outline his actual process without giving a precise formula or many details. Rivera's encaustic recipe contains beeswax, copal and elemi resins diluted in oil of spike and petroleum essence, and was cauterised by blow-torch flame. He recalled using three treatises for his research: Paillot de Montabert, Duroziez and Pliny.

The *Traité complet de la peinture* written by the French painter and theorist Jacques-Nicolas Paillot de Montabert (1771–1849) is a very rare and interesting source, but probably not the most accessible one. Paillot de Montabert is a fascinating author who produced a thorough study on art

Figure 4 Diego Rivera, *Montserrat*, 1911, oil on canvas, 125.1 × 145.4 cm, National Gallery of Art, Washington, Collection of Eugene and Agnes Meyer, Gift of their daughter Elizabeth Meyer Lorentz. (Photo © Banco de México Diego Rivera and Frida Kahlo Museums Trust/Artists Rights Society)

history, drawing, colour, composition and painting technique, with scientific observations on light and molecules and philology (Paillot de Montabert 1829–51). Paillot de Montabert was a student of Jacques Louis David and during the first decade of the 19th century he resolved the controversy which had been established between Count Caylus and Diderot concerning the methods of encaustic painting as described by Pliny and the 'revival' of the technique that the discovery of Herculaneum prompted (Rice 1979). Paillot de Montabert combined the aspiration of archaeological precision with scientific research methods applied to the craft of painting. He was in contact with antiquarians and the surgeon Dr Lemoine, an expert in wax anatomical models; his formula was later followed by Delacroix (Rice 1979). Volume 8, even though announced as *Procédés matérielles*, deals extensively with the origins of encaustic and the diverse materials and procedures of this ancient technique (Paillot de Montabert 1829–51, 8: 503–622), and contains the author's defence of encaustic as painting par excellence in contrast to the changes in colour and the darkening characteristic of oil painting.

A well-informed writer, Paillot de Montabert reviewed the most famous authors in this tradition: the French antiquarian Comte de Caylus (1692–1765) and the philosopher Denis Diderot (1713–1784). Furthermore, he studied the classical sources: Pliny's *Historia naturalis* and Vitruvius' *De architectura*. The text also deals with the philological problems of deciphering the types of specific materials or procedures in Greek texts, which still constitute one of the main problems with the definition of encaustic, as will be discussed later. It is symptomatic that Paillot de Montabert placed his consideration of encaustic after a long chapter in colour. It seems that wax and resin mixtures were considered to guarantee the luminosity and permanence of colour, a concern that Rivera also shared. Paillot de Montabert recommended a formula almost identical to Rivera's: a mixture of beeswax with elemi and copal resins diluted in oil of spike, which he regarded as the best substance for combining them, as both resins are white materials whose appearance grows more characteristic with cauterisation, and which protect the coloured pigments. He observed the 'optical character' of the copal resin and claimed that this mixture produced 'a diaphanous substance that absorbs the luminous rays that transverse it' (Paillot de Montabert 1829–51, 8: 564–6). Paillot de Montabert also suggested applying a layer of copal resin before starting to paint, a procedure that Rivera followed precisely.

A central issue in the revival of encaustic during the 18th and 19th centuries was the ability of the colours to preserve their hue without changing, supposedly substantiated by the permanence observed in the wall paintings at Herculaneum and Pompeii and later in the Copt Al Fayum mummy portraits. The very existence of the encaustic technique in antiquity has been challenged by some philological and scientific material studies, which regarded the presence of wax as a product of conservation (Omarini 2012). Recent research has been able to attribute the wax as the original binding medium in ancient painting traditions: it was clearly identified in a Greco-Roman portrait from the 2nd century through macroscale multimodal chemical imaging, a combination of hyperspectral

Figure 5 Painting in the Divisionist style with a brush per colour: a comparison of Boccioni and Beloff portraits. Left: Humberto Boccioni, *Self-portrait* (on reverse of the support), 1908, 70 × 100 cm, Pinacoteca di Brera, Milan, Italy. Right: Angel Zárraga, *Portrait of a Painter* (*Angelina Beloff*), 1916, 99 × 81 cm, Manuel y María Reyero Collection.

reflectance, luminescence and X-ray fluorescence (Delaney *et al*. 2017), and also in a group of portraits from Tebtunis, Egypt, using a multi-analytical approach (Salvant *et al.* 2017).

Encaustic and experiments in colour

Rivera scorned his teacher, friend and rival, Gerardo Murillo 'Dr Atl', who created the *Atl-colours*, soft crayons made of similar mixtures to encaustic medium: beeswax, copal resin, turpentine and linseed oil, and sometimes also paraffin or petroleum (Barquera and Zetina 2017). Dr Atl designed a modern and practical way of painting on any surface, which avoided mixing colours. The *Atl-colours* represented an experiment in the division of tone. Dr Atl made tone scales of pure pigments by gradually adding zinc white, seeking the so-called optical mixtures proposed by the Divisionist or Chromoluminarist painters, colour crayons that would superimpose without blending. He also used them to finish his easel paintings (Barquera and Zetina 2017).

Rivera referred to Dr Atl as a 'blind follower' of Giovanni Segantini (1858 –1899), but he too was interested at the time in Seurat Divisionism (Fig. 4). Angelina Beloff, the Russian painter and Rivera's wife at the time, described in her memoirs that during an extended visit to Spain he painted in the manner of Seurat, and that he was reading *D'Eugène Delacroix au néo-impressionnisme* by Signac (Beloff 1986: 37; Signac 1911). Signac was using what he called optical mixtures for colour to obtain maximum luminosity, coloration and harmony in the finished work. In his book, Signac suggested that the Impressionist method is somehow a derivation, or a successor, of Delacroix's findings on colour in painting. He placed Delacroix as the founder of a genealogy of precursors that also contributed with a non-traditional and standard approach to colour (Signac 1911).

The *Grammaire des arts du dessin* (*Grammar of Painting*), 1867, by Charles Blanc was the main source for Signac's comments concerning colour theory and Delacroix. The notion that it was possible to reproduce optical mixtures with pigments through the separation of tone was an artistic idea that was widely exploited, bolstered in scientific terms by a misreading by Blanc of Michel Eugène Chevreul's theory of colour, which stated that subtractive mixtures could be emulated by additive mixtures in the eye of the beholder (Roque 2009).

Rivera and Dr Atl regarded wax mixtures as a transparent substance that could serve as an ideal medium for experimenting with colour. Undoubtedly Rivera researched optical mixtures of colour and become an expert in the division of colour. While in Barcelona, he produced *Montserrat* (1911), a Divisionist landscape (Fig. 4). He described how he used several brushes to avoid the contamination of colours, similar to the way in which Boccioni depicted himself in his self-portrait in the Divisionist style, and to the portrait of Angelina Beloff by Angel Zárraga (Fig. 5). Rivera elaborated on how he made this painting with seven colours divided in seven tones and he even compared them to the effect of the European antiquity mosaics and pre-Hispanic feather mosaics (de la Torriente 1959: 2, 7).

In the 1951 treatise Rivera defined the qualities that he valued in the encaustic technique: 'what I wanted was the traditional encaustic with its solidity and the enamel-like quality, with the purity and deepness of its tones'. He attributes the theory not only to Paillot de Montabert's treatise but also to a brochure by Duroziez (Duroziez 1838; Constant Viguer *et al.* 1845). When Rivera visited Duroziez' descendants, proprietaries of the Luxembourg Pharmacy on the Boulevard

Figure 6 Fermín Revueltas, *Alegoría de la Virgen de Guadalupe* (*Allegory of the Virgin of Guadalupe*), 1922–1923, 8.5 × 8.35 m (70 m^2), encaustic over concrete, Patio Grande, Antiguo Colegio de San Ildefonso. (Photo © Bob Schalkwijk)

Saint Michel, he was told that the company had prepared the colours for Delacroix murals at Saint Sulpice in Paris. Once again Rivera described a very detailed experiment in colour, explaining Delacroix's process of making the murals (Rivera and O'Gorman 1993: 12–13).

Rivera wrote that the great master Delacroix inspired him; the master's palettes were famous for their organisation and for experiments in colour contrast.[5] In this regard, the modern genealogy of encaustic and colour could be the line established as follows: Delacroix, Cézanne and Seurat. Cézanne was also an admirer of Delacroix, especially of the Saint Sulpice murals, which he placed at the core of the development of modern ideas on colour expression and brushstroke, a place that those murals held for other artists such as Vincent van Gogh and Seurat (Noon and Riopelle 2015; Roque 2009).

But Rivera traced back far beyond the artistic genealogy of encaustic, including experimentation as part of the paradigm, linking it with Leonardo da Vinci's *Last Supper* (although Leonardo's supposed experiment in encaustic was probably the *Battle of Anghiari*). Rivera's research led him to the 'true origins' of the technique, thought to be in the art of ancient Greece, so he went to museums to observe the Al Fayum portraits, probably at the Musée du Louvre, Paris, or perhaps at the Archaeological Museum in Florence where he sketched several Etruscan pieces (Bargellini 1996): 'I resolved to go to the source. The sources of my observations were the Greek, Copt, Egyptian and Roman paintings, but they kept enigmatically the secret of their execution.'

Finally, Rivera found the original source of the concept of the encaustic process: Pliny the Elder. Rivera fictionalised his research, proposing that he had made two discoveries: on one hand, that the mysterious substance that the Greeks were using for dissolving the resins was petroleum, and on the other, that the *cauterium* or the mysterious instrument able to 'cauterise' the surface and produce 'the real encaustic' was the blowtorch used by plumbers of Rivera's own era. He commented that 'Pliny said regarding [the *cauterium*] that "the painters use it for the fine works the torch of the craftsman and the silversmith". I remembered the silversmiths from my childhood in Mexico and how they used a thick wick lamp with alcohol or petroleum' (Rivera and O'Gorman 1993: 16).

The invention of a Mexican encaustic tradition or following the followers

Four other younger artists followed Rivera's example and used encaustic in different ways. Even if it was not necessary to develop their formulas and techniques as expertly as Rivera's, the younger artists were keenly interested in issues regarding national identity, fiercer in their approach to such

Figure 7 Fernando Leal, *La fiesta del Señor de Chalma* (*Feast of the Lord of Chalma*), 1922–1923, 8.36 × 6.77 m (55 m^2), encaustic over concrete, Antiguo Colegio de San Ildefonso. (Photo © Bob Schalkwijk/Fernando Leal/Artists Rights Society)

Figure 8 Jean Charlot, *Masacre en el Templo Mayor o La Conquista de Tenochtitlán* (*Massacre at the Templo Mayor*), 1922–23, 8.36 × 6.77 m, encaustic over fresco, second level of the staircase of the Antiguo Colegio de San Ildefonso. (Photo © Bob Schalkwijk/Jean Charlot/Artists Rights Society)

problems that were relevant after the Revolution and that were addressed timidly in Rivera's encaustic mural.

Revueltas' *Adoración de la Virgen de Guadalupe* (*Adoration of the Virgin of Guadalupe*) (1923) is a painting that seems to be in dialogue with *Adoración de la Virgen* and Rivera's *La Creación* (Fig. 6). It depicts a pyramidal composition with the Virgin of Guadalupe at the top, designed with circles drawn with compasses in a similar way to Rivera's design, but with some areas almost monstrous in their monumental yet *naïf* quality. But the subject and the depiction, even the radical approach to colour, was later directed by Rivera into the Ministry of Education frescoes. Revueltas used the chiselled contours and the blowtorch, but he probably used an inaccurate formula for the medium, since some of his colours have altered.[6]

Leal, in *La fiesta del señor de Chalma* (*The Feast of the Lord of Chalma*) (1923) (Fig. 7) chose a wall on the stairs of the National Preparatory School and created a composition that echoed Charlot's *Masacre en el Templo Mayor o La Conquista de Tenochtitlán* (*Massacre at the Templo Mayor*) (Fig. 8). The composition explores the Catholic religious feasts as well as pre-Hispanic traditions that had survived the conquest, including spiritually rapturous states experienced through dances with feathered costumes. Both subjects would become some of Rivera's favourite pictorial themes: the conquest and the continuity of pre-Hispanic culture. Moreover, the placement of the murals above the stairs for the appreciation of movement and varied points of view would become an important practice for Rivera and Siqueiros. Leal used a dissolved encaustic that he applied with a brush, rather than using a blowtorch – he even

Figure 9 David Alfaro Siqueiros, *Los elementos* (*El espíritu de occidente*) (*The Elements, the Spirit of the West*),1923, 4.40 × 3.0 m and *San Cristóbal*, 1923, 2.70 × 1.90 m, both encaustic over concrete, stairway Colegio Chico, Antiguo Colegio de San Ildefonso, Museo de la Luz. (Photo © Bob Schalkwijk/David Alfaro Siqueiros/Artists Rights Society)

applied a rough plaster ground prior to painting to produce texture. His formula in encaustic was therefore not considered the 'authentic' technique to the point that some felt the mural should be destroyed (Anon. 1925).

Charlot, the French painter who worked closely with Rivera, used the same kind of construction with circles drawn with compasses (Fig. 8) – it is even possible that he viewed a drawing made by Rivera after Ucello's *Battle of San Romano*. Charlot painted in the fresco technique and his indigenous noblemen with feathered headdresses 'dance' with Leal's contemporary indigenous dancers. He only used encaustic to paint the vermilion spears applied on top of fresco, probably as a result of reading Pliny. Siqueiros combined Michelangelesque proportions with indigenous features in one figure. He also used simulated architecture to create a space, more than a narration, altering the architecture with illusionistic stone walls and windows (Fig. 9). Because of its transparency, it seems that he used a very diluted encaustic – almost like an oil – but he changed the tonality to a muted palette of earth tones to represent the traditional colours of the indigenous peoples of Mexico. He recalled using a mixture of one part copal resin, one part beeswax and one part lavender oil (Alfaro Siqueiros 1951: 144–5). In later commissions Rivera would also integrate similar architectural structures in order to visually transform the space in which his murals were located.

Conclusion

Rivera's precise and eloquent explanations in *Sobre la encáustica y el fresco* reveal the artist's research regarding the use of natural materials, presenting his interest in the science of colour as well as his research into treatises and paintings by other artists. Other than the encaustic technique developed by Paillot de Montabert, Rivera's invention encompasses scientific knowledge on colour and archaeological accuracy or authenticity of his formula. Purity of colour was the central concern: the supposed transparency of the medium would permit experimentation with contrasts and harmonies only observed in spectral colour mixtures, and would therefore be an interesting medium for avant-garde experimentation with colour.

This urge to create murals, in particular during the early years from 1921 to 1926, assisted in establishing a community of painters who were immersed in both intense exchange of ideas and competition; those years were dedicated to experimentation, research and debate and a large corpus of documents was produced around these practices. The debate concerning the first murals continued well into the 1950s and 60s. This Mexican mural initiative was probably not so different from the so-called return to order, the return to figuration of European artistic movements in Italy, Germany and France: the *rappel a l'ordre* that strived for classicism, but that had as its technical parallel the cultivation of the *métier* after the end of the First World War (Silver 1989; Vacanti 2006, 2014).

These murals were crafted on the first walls given to the artists, so they were an important enterprise, whose results very much defined the success of fresco. The selection of wax as the first option was probably the result of an interest in permanence stemming from the notions that surrounded wax as a material or a medium that was almost indestructible and that could therefore meet the expectations of preservation of colour and permanence, while also adding the important property of luminosity. Using wax also had strong symbolic implications since it established a noble artistic genealogy: it linked the Mexican Revolutionary mural movement with antiquity and classical art: as early as 1923, Dr Atl and Charlot started to call the Mexican mural movement the 'Mexican Renaissance' (Dr Atl 1923).

The use of wax also permitted new experimentation with materials not previously included in the academic curriculum. For instance, Alfaro Siqueiros continued his experimentation with the medium in a series of easel paintings produced in Taxco in the early 1930s using mixtures of earth pigments acquired in the mineral-rich mountains in the surrounding area, which he bound in a mixture of oil and wax, as confirmed by technical examination (Arroyo *et al.* 2013). Alfaro Siqueiros, like many other Mexican artists, started to theorise about the importance of painting techniques, of tradition, geometry and composition, and the reading of treatises written by a generation of erudite painters interested in claiming their own place in the history of techniques. Even Rivera was quoted as saying that *La Creación* was a painting that superseded his intentions. The composition strived for an avant-garde approach but was perfectly associated with the 'aura' of the technique and also visually linked to the classical past and antiquity. In this way, Rivera somehow used the technique, as he had used the past, as an avant-garde gesture for retaining tradition in a utopian future.

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Notes

1. 'En primer lugar para que los colores no se 'corran' y en segundo lugar porque el dibujo de incisión tiene más carácter arquitectónico que el dibujo de trazo' (Ortega 1923).
2. 'La pintura ha sido ejecutada a la encáustica, con los mismos elementos puros y el mismo proceso empelado en Grecia y en Italia en la antigüedad, este procedimiento que el autor restauró por su propio esfuerzo, gracias a búsquedas hechas durante unos diez años, es el más sólido de los procedimientos de pintura, salvo el esmalte a fuego' (author's translation).
3. 'Este es un procedimiento que quise emplear porque es más duradero que el "fresco" que es para mi el procedimiento ideal de decoración y de pintura. En Pompeya, como en Grecia, no queda un sólo "fresco" … fui a Grecia únicamente para estudiar el procedimiento que voy a empelar ahora.'
4. The precise dimensions of *La Creación* are 7.08 × 12.19 m.
5. A tin palette that belonged to Delacroix, and a box (which could possibly be used for heating the wall) are preserved at the Musée National Eugène Delacroix. The technical studies carried out prior to the conservation process of the Saint Sulpice murals show that Delacroix painted over a plaster impregnated with carnauba wax, to which he applied as many as 14 layers of several materials and mixtures of oil, resin and wax. It was not possible to confirm Rivera's version of the pharmacist Duroziez preparing the colours for Delacroix.
6. The blue tones of the clouds and the sky, and the red dresses of the woman suspended around the Virgin, had lost colour. Those regions turned brown with no relation to the composition; see Figure 6.

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