

Beyond the Painted Surface: Conserving the Yeh Chi Wei Paintings in the National Heritage Board Collection

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Introduction

In preparation for the Yeh Chi Wei retrospective exhibition, conservators at the Heritage Conservation Centre (HCC) had the opportunity to closely examine all of Yeh Chi Wei's paintings in the National Heritage Board (NHB) collection. This was the first time that all of the artist's paintings were looked at as a group from a conservation perspective. Out of all the paintings surveyed, many similarities were found with regards to the techniques and materials used by the artist, and many of them also presented similar conservation problems and forms of deterioration. Most of these works would have been executed in Singapore after the artist returned from his various trips to Southeast Asian countries. It is likely that prior to acquisition, the works were kept in unfavourable environments, which has resulted in the rapid deterioration of many of them. For this reason, most of his paintings were found to have undergone some type of restoration, in many cases done by the artist himself.

The close examination of all of his works allowed for the collection of valuable data on the materials used by the artist, the structure and construction of the artworks and the common conservation problems found on his works. This essay provides an insight into the findings from the materials and condition survey undertaken by paintings conservators at HCC and an overview of the conservation treatments carried out on Yeh Chi Wei's paintings.

An Insight into Yeh Chi Wei's Materials and Techniques

Yeh Chi Wei's Painting Supports

A survey of the physical characteristics of the 26 oil paintings by Yeh Chi Wei in the NHB collection was conducted.¹ All of the paintings examined were found to be on canvas supports, some of which were mounted on a rigid support at a later date. It appears that Yeh was quite consistent in his choice of canvas: Most of the works surveyed were painted on linen canvas, mainly of a good quality type with plain weave and medium weight.² All of the works examined were commercially prepared with a priming layer ready for painting, meaning that Yeh Chi Wei did not have the habit of priming the canvases himself.

His works are found in a variety of sizes, but many of the paintings examined had dimensions of approximately 92 cm x 105 cm. A group of his works are executed in an unconventional long shape, either in vertical form, simulating the shape of a Chinese scroll painting, as in *The Dayak Plays the Musical Instrument*, or using a similar format in horizontal shape, such as *Lake Toba*.

All of his paintings are mounted on strainers (a form of stretcher with fixed joints, which does not allow for re-stretching), a common practice in Singapore for artists of his time.

Many of Yeh Chi Wei's paintings have signs of re-stretching after the creation of the work. This is evident in cases where there are two or more sets of tack or staple holes, or where the paint layer is folded over the side of the stretcher, such as in *Singapore Seafront* (Fig. 1). Others present parallel horizontal or vertical cracks, such as in *Angkor Wat* (Fig. 2), which often appear when a painting has been rolled. It is likely that paintings were unstretched and rolled for storage for long periods of time, and re-stretched only when works had to be displayed. In fact, many of the paintings kept with the Yeh family are still unstretched.



Fig. 1: Back of *Singapore Seafront* showing paint folded over the edge. Fig. 2: Vertical cracks in *Angkor Wat* viewed with raking light.

Some of the original stretchers that have survived to date, such as those of *Mother and Child* (see Fig.3), *Untitled* or *Untitled* have a rough finish and appeared to be handmade, possibly by the artist.



Fig. 3: Back of *Mother and Child*.

Examination of the back of the works also revealed many original inscriptions that had not been previously documented, such as in the case of *Mother and Child* (Fig.3). The back of some works could not be examined, as some paintings have been mounted on a stretcher board (strainer nailed

to a rigid board, normally plywood). However, these works are generally in better condition as the rigid support has provided protection from environmental fluctuations and other agents of deterioration.

Yeh Chi Wei's Painting Materials

A paint box from Yeh Chi Wei's studio has survived (Fig. 4), providing valuable information on some of the painting materials used by the artist. The box contained 31 half-used or nearly empty oil paint tubes of various brands, plus other materials such as paint brushes, spatulas and glittering powder. Some of the paints were very deteriorated, with oxidised labels that made the colour name illegible. However, the paint tubes³ show a large selection of yellow and green colours. Although the contents are not exhaustive, and the artist could have used a lot more oil colours than the ones found in the box, they provide an indication of his choice of materials. It is also evident that the artist did not stick to one brand of paint, but instead used a variety of brands.⁴

A bottle of the now discontinued painting medium 'Win Gel' was also found in his paint box. This viscous medium, made of a synthetic resin,⁵ was used as a medium to increase the gloss and transparency of colours. According to information provided by Winsor & Newton, in some cases Win Gel was "a little difficult to break down and to mix smoothly with colours" and it has now been replaced by Liquin Light Gel.⁶

Another interesting finding was an old bottle of yellowed Grumbacher 'Crystal Clear Picture Varnish,' made of synthetic resin according to its label (Fig. 5). From its name 'crystal clear,' it can be presumed that this varnish was originally transparent, and its current yellow colour is the effect of aging. At the time of writing, it is unknown if Yeh Chi Wei used this particular varnish to coat all of his paintings; however, many of his works in the collection present varnishes that have also yellowed over time.⁷



Fig. 4: Yeh Chi Wei's paint box. Collection of the Yeh family. Fig. 5: Varnish bottle found in Yeh Chi Wei's paint box. Collection of the Yeh family.

Layers of Colour and Texture

Yeh Chi Wei used a palette knife to create a textured surface that paintbrushes could not achieve.⁸ Hence, most of Yeh Chi Wei's paintings are very textured, presenting a rich application of oil paint resulting in various degrees of impasto. Some works present many layers of paint, creating a thick paint structure.

In some cases, this rich application of paint in successive layers has resulted in extensive cracking in certain colours. Cracks and separation of paint layers can appear very early in an oil painting when 'lean' paint (mixed with turpentine) is applied on top of 'fat' paint (straight out of the tube or mixed with oil).⁹ Cupping, a form of cracking where the edges of the cracks raise to form small concave islands of paint in the form of a 'cup', was also found in many of his works. The painting *Drummer* presents one of the most pronounced cases of cupping (Figs. 6 & 7). This form of cracks is also a consequence of the technique used by the artist and the application of many consecutive layers of paint. As a consequence of early formation of cracks and pronounced cupping, many paintings have suffered from lifting and flaking of paint, resulting in extensive losses of original paint.¹⁰



Fig. 6 & 7: Details of cupping cracks in *Drummer*.

In a few paintings it was observed that the number of paint layers was unusually large. In some of these instances, losses of paint revealed another layer of paint underneath with contrasting or unrelated colours that did not correspond to the artwork, such as in *Portrait of a Dayak Lady* (see Fig. 8). This raised the question of the possible presence of another painting underneath the existing one. In an attempt to confirm this possibility, tiny samples of flaking paint were taken from *Portrait of a Dayak Lady* and cross-sections were prepared.¹¹ When samples were observed under microscope, it was found that as many as nine layers of paint were present in the samples (Fig. 9). A second layer of white priming on top of thick layers of paint was found in all samples examined. In some cases, this white layer is on top of a thin resinous glaze or varnish, which is normally applied as

a final layer of paint. This leads to the conclusion that the artist did paint *Portrait of a Dayak Lady* over another work, after applying a layer of white priming over it. The reason for this remains unknown, but possible explanations could be dissatisfaction with the previous work, or unfavourable circumstances leading to the 'recycling' of paintings materials. Other works that appear to have been painted over another artwork include *Angkor Wat* and possibly *Bust of Angkor*.

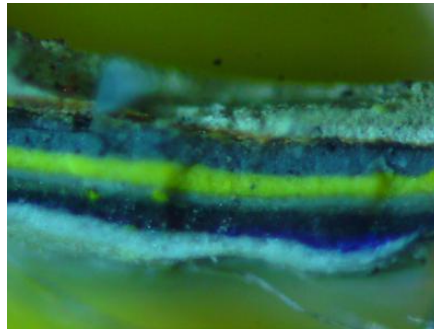
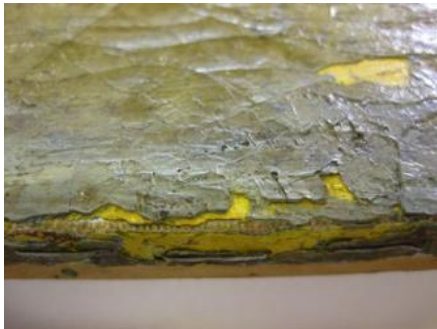


Fig. 8: Edge of *Portrait of a Dayak Lady* showing layers of paint underneath. Fig. 9: Cross-section of sample taken from the left edge of *Portrait of a Dayak Lady*.

Later Interventions and Additions

Many of the paintings examined were heavily restored, presenting large areas painted over old losses of original paint. In some cases, such as in *Lake Toba* (see Fig. 10), these overpainted areas are so extensive that it is unlikely that it is the result of a previous restoration. These overpainted areas look like they were done quite soon after the creation of the artwork when observed under Ultraviolet (UV) light.¹² Therefore it can be presumed that the artist himself painted them. It is quite likely that the paintings presented early problems of flaking, resulting in losses of paint, which led to the artist repainting damaged areas of the work.

Some of his paintings were also found to be primed with white paint on the back of the canvas, such as in the case of *Singapore Seafront* (refer to Fig. 1). It is unknown when or why this was done, but one possible reason would be that the artist applied this layer to seal the back of the canvas to prevent deterioration, or with the hope that it would penetrate through the canvas and would help to glue back in place some of the already existing flaking paint on the front. Many paintings also appear to have a layer of varnish applied on the back of the canvas, or patches of varnish applied only on top of the cracked areas. This was probably also done as an attempt to reattach flaking paint. In some of these cases the varnish has gone through the cracks, appearing on the front of the painting unevenly (Fig. 11) or staining the back of canvas when applied from the front.

It was learnt from the artist's family that none of Yeh Chi Wei's paintings kept in the family had been sent for restoration treatment. However, correspondence with Yeh's granddaughter

revealed that her father had previously varnished a number of Yeh's paintings.¹³ Therefore, many of the present varnishes could have been applied either by the artist or by his son.

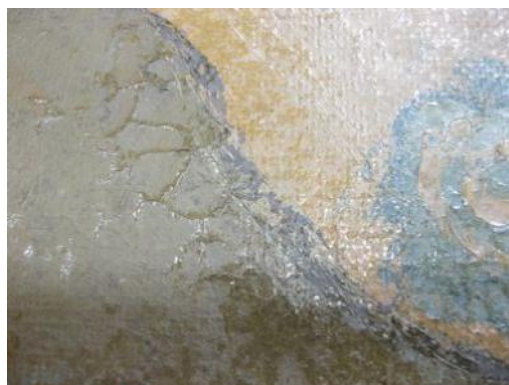
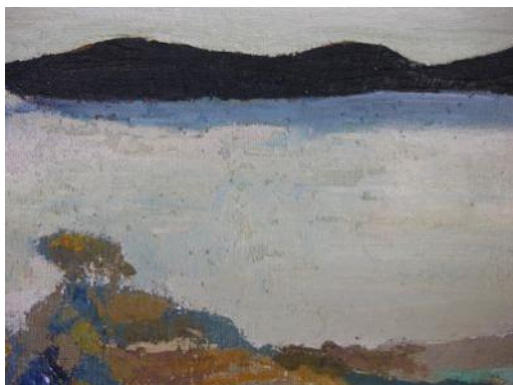


Fig. 10: Detail of overpainted areas over losses of paint in *Lake Toba*. Fig. 11: Detail of cracks in *Untitled*.

Beyond the Naked Eye: UV and IR Light Examination

Examination with ultraviolet (UV) light can reveal much valuable information on surface layers on an artwork not visible under normal light such as varnishes, later additions or restorations, overpainted areas, fake signatures and so on.

In the painting *Singapore Seafront*, the bottom and right edges of the work are folded over the stretcher (refer to Fig. 1). This raised doubts about the position of the signature, which was in a 'normal' position (on the bottom right corner), but if the edges of the painting were to be unfolded then the signature would be placed in an awkward location. The uncertainty was solved by observing the signature under UV light: The signature was painted over the yellowed varnish, confirming that it was applied much later after the completion of the work (Fig. 12). As this is one of Yeh's early works, it is possible that later in life the artist mounted this unstretched painting onto a stretcher by folding the edges (probably to cover some existing damages), framed it and then signed it on the corner. The same type of stretching and framing was observed in many others of his works, both in NHB and private collections. This was most likely done in an attempt to make this group of paintings more suitable for display, maybe on the occasion of an exhibition.

Another type of non-visible light used by conservators for examination of paintings is infrared (IR) light (Fig. 13). IR penetrates through layers of paint slightly deeper than normal light, and hence, it is used to see any preliminary drawings or sketches that the artist did before painting. Out of all the paintings examined, none of them appeared to have any under-drawing. In some cases, the thick layers of paint could have stopped the infrared light from penetrating deep enough to capture any under-drawing or preliminary sketch done by the artist. However, even in the artworks with a thinner paint layer, no evidence of under-drawings was found. It can therefore be

inferred that Yeh Chi Wei did not have the habit of sketching on the primed canvas before painting and therefore his paintings were done in a more spontaneous manner without previous sketching to guide him. This is in line with oral history information about the artist's techniques.¹⁴

Finally, IR light was very useful in uncovering an inscription on the back of *Singapore Seafront*. When examined under normal light, some faded traces of ink could be seen on the back of the work, but the back of the canvas had been covered with a layer of white paint, hence covering the inscription. With the help of IR light, it was possible to read the full text of the inscription, which contained the title of the painting, previously unknown (Fig. 14).



Fig. 12: Signature of *Singapore Seafront* viewed under ultraviolet (UV) light.

Fig. 13: Examination of Yeh Chi Wei's paintings with infrared (IR) camera at HCC.

Fig. 14: Inscription on back of *Singapore Seafront* viewed with normal light (above) and with IR light (below).

Conserving Yeh Chi Wei's Paintings in the NHB Collection

In preparation for the Yeh Chi Wei exhibition, 21 oil paintings were conserved at the Heritage Conservation Centre laboratories. As mentioned in the previous section, many of the paintings presented conservation problems such as pronounced cracking of the paint surface, flaking and extensive losses of original paint; in many cases, they had been overpainted by the artist at an earlier stage. All flaking paint was secured back into its original position by many hours of consolidation treatment. Consolidation is the process by which an adhesive is applied to restore the adhesion between layers that have separated, e.g., between primer and canvas, or between various layers of paint. The adhesive is applied with a small brush followed by application of heat to help the penetration and sealing of paint layers (Fig. 15). Nearly all of the paintings conserved required some degree of consolidation to secure the flaking paint. Where the losses of paint presented a

perceptible discontinuity in the image, these were reintegrated. Reintegration is the process by which the losses of paint in a painting are restored, thus recovering the continuity of the image. This is done by the application of a filling material to level the loss of paint with the surface of the painting followed by the application of colour to match the surrounding original (Figs. 16 & 17).



Fig. 15: Consolidation of flaking paint in *Portrait of a Dayak Lady*.



Fig. 16: Inpainting for *Mountain View* Fig. 17: Detail of *Angkor Wat* before and after inpainting.

Many of the paintings also had evidence of mould. Mould is a common occurrence in tropical climates such as Singapore's and it is commonly found on paintings that have been kept in humid environments without proper ventilation. Mould must have already been a problem in the early years after the paintings were created, since for some works, mould stains are present under the varnish layer. Examination of affected areas under the microscope can often help determine the degree of mould activity (Fig. 18). A number of paintings also presented discoloured varnishes, and dirt accumulation on both front and back of the painting. Therefore, another common treatment was surface cleaning to remove superficial layers of accumulated dust and mould (Fig. 19).



Fig. 18: Examination of mould stains under microscope in *Untitled (Temple Scene)*.



Fig. 19: Surface cleaning of *Untitled*.

Other forms of deterioration included some structural damages such as canvas distortions and deformations. Many paintings had lost their original tension and were therefore slack on the stretcher. In most cases, a preventive approach was taken in order to preserve the original mounting and paintings were left on their original stretcher and frame. A backing board with a polyester wadding insert was applied to the back of the painting to prevent vibration of the canvas when painting is moved or transported (Fig. 20).



Fig 20: Backing board with polyester wadding insert for *Untitled*.

A Case Study: The Conservation Treatment of *Untitled (Police Barricade)*

The oil painting *Untitled (Police Barricade)* was donated to NHB in early 2009. The date of this painting is unknown; however, based on the more representational style of the painting, it is probably one of Yeh Chi Wei's early works painted before 1960. It depicts a group of women who appear to be clearing debris or working on the construction of a new building.

Condition Before Treatment

During the initial examination, it was found that the canvas was very loose on its stretcher and had many distortions and creases. In a manner similar to other works, the painting had been restretched onto a smaller strainer (stretcher with fixed corners), folding the sides of the painting over the back of the stretcher. (Fig. 21 shows a detail of the back corner of the work before treatment.) Evidence of previous mounting (old tack holes and staple holes) was also found on the edges of the work. The painting was framed with a simple thin wooden frame, nailed directly to the sides of the painting, in a fashion similar to other works in both NHB and private collections.

The painting surface presented mould spots and a very discoloured varnish which was giving the work a dark orange-brown appearance, obscuring the original colours (Fig. 22). Other types of damage present in the painting included two tears (one already repaired with a coarse patch on the back) and some small holes on the canvas.

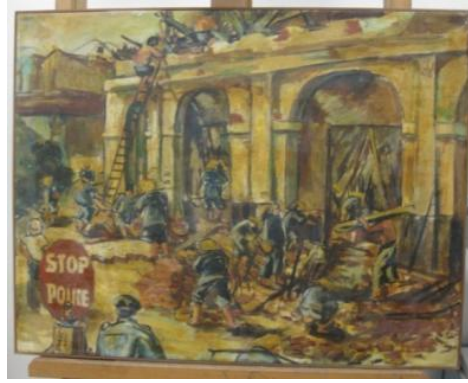


Fig. 21: Back corner of *Untitled (Police Barricade)*. Fig. 22: *Untitled (Police Barricade)* before treatment.

The Conservation Treatment

The first stage of the treatment involved cleaning the mould on the surface of the painting with a mild solution of fungicide. This treatment does not only remove the mould but also prevents its reappearance in the future.

As the frame was covering part of the folded image (4.5 cm and 3.5 cm of original paint were folded and covered at the bottom and left sides of the work), we decided to carefully remove the frame from the canvas in order to see if there was any concealed signature. Although no signature was found, the removal of the frame uncovered the previously unseen edges of the work, which contained quite a substantial part of the image.

It is quite likely that the artist restretched the painting himself, since the painting remained with the Yeh family until it was donated to NHB. The artist probably folded the edges of the painting in order to cover the tear in the bottom side of the work and one hole on the upper left edge of the painting (Figs. 23 & 24). Its thin wooden frame, nailed directly to the sides of the painting, was probably applied at the same time.



Fig. 23 & 24: Detail of edges of *Untitled (Police Barricade)* after removing the frame.

Once the frame was removed, it was also found that the edges of the work were not varnished, and therefore the yellowed varnish was not original to the work, and had been applied after the restretching. Varnish remains were also present on the sides of the frame, meaning that the work was varnished when it was already in its frame. This varnish could have been applied by the artist himself or at a later date by his son.¹⁵

Following unframing, the previously covered edges were documented and the canvas was unstretched. This was necessary in order to access the back of the painting to repair tears on canvas edges. Unstretching allowed the full extent of the image to be seen (Fig. 25),



Fig. 25: *Untitled (Police Barricade)* after unstretching.

The canvas was then surface-cleaned, and the old patch and remains of glue were removed mechanically. After that, the distortions on the canvas were flattened and all tears and other damages on canvas were repaired.

The next stage of the treatment involved evaluating the need for removing the discoloured varnish. Removing a darkened varnish is not considered a conservation treatment necessary for the preservation of a painting, and it is instead done for purely aesthetic reasons. Its removal can change the look of a painting quite dramatically, which sometimes creates controversy between those who support returning the painting to its 'original look' and those who believe in keeping its 'old look' and therefore, consider the discolouration as an integral part of the artwork and its history.

The varnish was identified as shellac by its characteristic fluorescence under UV light (refer to Fig. 28). Shellac is not recommended for use as a varnish for paintings, as it oxidises quite quickly over time, resulting in a very orange-coloured coating. Therefore, a decision was made to remove the varnish based on the following reasons:

1. The discoloured varnish was diminishing the painting's visual appearance and impeding proper appreciation of the colours used by the artist;
2. The varnish would continue to darken;

3. The varnish gave the painting a very different appearance to all the other works by the same artist.

Tests were carried out to determine the solubility of the varnish and to test an adequate solvent that would not affect the original paint. Varnish was then removed by softening it with solvents applied with cotton swabs over the whole surface of the artwork to allow for the swelling of the oxidised varnish (Figs. 26-28). The removal of the varnish returned the painting to its original vibrant colours.



Fig. 26: Removing oxidised varnish from *Untitled (Police Barricade)*. Fig. 27: Detail of discoloured varnish being removed from the white colour.

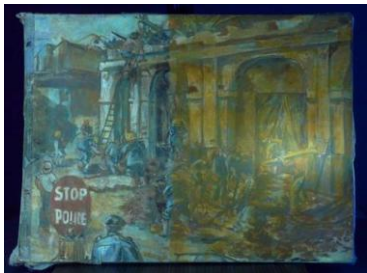


Fig. 28: *Untitled (Police Barricade)* with varnish removed from its left half when viewed under UV light. Remaining shellac varnish has a characteristic orange fluorescence under UV light.

After varnish removal was completed, the next task was to evaluate whether to restretch the canvas back in the same manner as before the treatment, with the edges folded over the strainer, or to return the painting back to its original dimensions, and therefore show the previously covered edges. The latter option would mean having to restretch the work onto a new larger stretcher and also reframing it into a new larger frame. After discussions with the exhibition curator, it was decided to restretch the painting back to the way it was before treatment, as it is unknown why the artist decided to reduce its size. Moreover, many other works are also folded in the same manner, and in this way, the original stretcher and framing of the work could be preserved.

The painting was therefore mounted back onto its original strainer, with an application of a strip-lining to reinforce damaged canvas edges.¹⁶

A clear coating of acrylic resin varnish was applied to replace the original varnish, and losses of paint were filled and in-painted with pigments and a water-based medium to allow for easy reversibility in the future.

Finally, the original frame was nailed to the sides of the painting using the same holes for the original nails and the back of the painting was covered with a protective backing board.

After conservation treatment (Fig. 29), the painting *Untitled (Police Barricade)* recovered its original bright colours and the continuity of its canvas support. The conservation treatment allowed for documentation of covered parts of the work, while retaining the original mounting and framing style characteristic of many other works by Yeh Chi Wei.

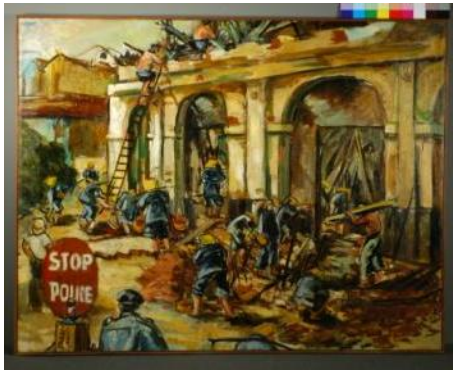


Fig. 29: *Untitled (Police Barricade)* after conservation treatment.

Conclusion

The technical examination and conservation of Yeh Chi Wei's paintings in the NHB collection enabled a better understanding of the artist's materials, and the forms of deterioration and later restorations commonly found in his works. The close examination of the paintings allowed for the uncovering of important information such as original inscriptions, their structure and layering, and the techniques of the artist. Further study into works by the artist held in other collections will complement the above findings. The conservation of many of his paintings has contributed to the preservation of Yeh Chi Wei's body of work into the future, and, most importantly, has allowed for the Yeh Chi Wei collection in NHB to become accessible to the public and thus raise awareness of Yeh Chi Wei's significant role in Singapore art history.

Author's Acknowledgements

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Notes

¹ The survey was limited to Yeh Chi Wei's oil paintings. Works of other media such as watercolour or ink on paper are not included in this study.

² Many of the canvases examined had a thread count of 10 x 10 threads per centimetre.

³ The colours that could be identified are Lamp Black, Cerulean Blue (Phthalocyanine), Prussian Blue, Turquoise Blue, Burnt Siena, Burnt Umber (x 2), Chrome Green, Terre Verte, Monestial Green (x 2), Cadmium Green Light, Rembrandt Green, Emerald Green Extra, Cadmium Green Pale Im., Carmin Aliz., Pink Madder, Cadmium Red, Chrome Orange Deep, Chrome Yellow*13 (x 2), Rembrandt Yellow (x 2), Chrome Lemon, Cadmium Yellow, Cadmium Orange and Titanium White.

⁴ Brands found include Talens' Rembrandt Oil Colours, Amsterdam Oil Colours, Fine Oil Colours, Winton Oil Colour, Rowney Georgian Oil Color for artist and Flying Eagle artist oil colours.

⁵ Winsor & Newton's Win-Gel was made with an oil-modified alkyd resin.

⁶ Winsor & Newton website, <http://www.winsornewton.com/products/oils-solvents-mediums--varnishes/frequently-asked-questions/> (accessed February 7, 2010).

⁷ Future varnish characterisation by analytical means could determine if varnish in the bottle is of the same type as varnishes found on his paintings.

⁸ Interview with Jacey Yeh Yue Hann (Yeh Chi Wei's granddaughter), in Samudra, 2007, "My grandfather Yeh Chi Wei," *NUS Museum Newsletter* 4, 7.

⁹ Lean paint dries faster than fat paint. Layers in an oil painting should be built up from lean to fat. If lean paint is applied on top of fat paint, top layer will dry first. When the thicker layer underneath finally dries, the upper layers often crack.

¹⁰ Flaking is a conservation term used to describe the detachment of paint layers from the primer or canvas layer.

¹¹ Cross-sections are prepared by embedding a tiny sample of paint in clear resin and slicing it through the middle to observe the layer structure in the sample.

¹² Recent layers of paint or restorations have a very different fluorescence under UV light than the original paint, while older restorations have a similar fluorescence.

¹³ Yeh Chi Wei's son had the habit of varnishing his father's paintings to 'upkeep' them (Email correspondence with Jacey Yeh Yue Hann, Yeh Chi Wei's granddaughter, 24 August 2009).

¹⁴ Interview with Jacey Yeh Yue Hann (Yeh Chi Wei's granddaughter), in Samudra, 2007, "My grandfather Yeh Chi Wei," *NUS Museum Newsletter* 4, 7.

¹⁵ See endnote 13.

¹⁶ Strip-lining is the process by which strips of canvas are adhered to the edges of a painting to allow re-stretching