TRABAJO DE FIN DE GRADO

BIOGRAPHIC STUDY AND RESTORATION OF A 19TH CENTURY'S OIL ON CANVAS

PORTRAIT OF MAGISTRATE JOSEPH BERNARD FALQUET (1776 – 1836) BY THE FRENCH PAINTER JACQUES GUILLE (1814 – 1873)

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ABSTRACT

This Final-Year Project of the Bachelor's Degree in Conservation and Restoration of Cultural Heritage (University of Valencia, Spain) focuses on an easel oil-on-canvas portrait from 19th Century France. The project has been undertaken through an internship with ArtLab Australia, and consists of (1) a research component to identify the provenance of the portrait, and (2) a technical component to elaborate and implement a protocol of restoration.

The painting lacked author signature, and had a hand-written annotation on the backside of the stretcher indicating that the painted character was an adult male with the surname Falquet from the town of Chambery (Savoy, France). Based on a review of the primary literature and personal communications with international experts, it was concluded that the portrait was painted by Jacques Guille (a French artist who specialized in religious paintings), and the portrayed man was Baron Joseph Bernard Falquet (a French magistrate who played important institutional roles in post-Napoleon Savoy). The style of the portrait falls in the range of neoclassicism and realism.

Overall, the portrait was in poor condition. The canvas had a tear in the lower-left corner and had lost paint layers mostly along its edges, and the pictorial surface was entirely covered with superficial dirt. Repainted areas from a previous intervention were found over a stucco that filled several holes in the fabric of the canvas.

The restoration protocol applied to the portrait was based on photographic and reflectographic analyses and followed Artlab's canonical procedures with the major goals of enhancing structural stability with a new stretcher, re-establishing canvas integrity, removing old-restoration patches, restoring the paint layers and providing protection for long-term preservation.

Throughout, the project benefited from the exposure to the *modus operandi* of a professional team and from contrasting the theoretical fundaments provided by a Bachelor's Degree with the true process of restoration of a piece of art.

KEY WORDS

Artlab Australia, conservation, France, neoclassicism, lining, reintegration

RESUMEN

Este Trabajo de Fin de Grado en Conservación y Restauración de Bienes Culturales (Universidad Politécnica de Valencia, España) se centra en un retrato al óleo sobre lienzo de la Francia del siglo XIX. El proyecto se ha realizado gracias a una estancia de prácticas en la empresa australiana Artlab, en dos fases de trabajo: (1) una investigación sistemática sobre la procedencia del retrato, y (2) y la concepción e implementación de un protocolo de restauración de la obra.

La pintura carecía de firma, y presentaba una nota escrita a mano, en el reverso del bastidor, que indicaba que el retrato representaba a un varón adulto de la familia Falquet de la localidad francesa de Chambery (Saboya, Francia). En base a la literatura primaria y comunicaciones con expertos, se llegó a la conclusión de que el teatro fue creado por Jacques Guille (artista francés especializado en pintura religiosa), y el hombre retratado era el Barón Joseph Bernard Falquet (magistrado que ocupó importantes cargos institucionales en la región de Saboya en tiempos posteriores a Napoleón). El estilo del retrato se encuadra dentro de la corriente neoclásica.

En general, la obra se encontraba en mal estado de conservación. El soporte textil presentaba un desgarro en la esquina inferior izquierda, se localizaron pérdidas de estrato pictórico en los bordes, y la superficie pintada estaba cubierta de suciedad superficial. Además, se identificaron zonas con abundante repinte como resultado de una intervención previa que había rellenado con estuco varios agujeros en el textil del lienzo.

La obra fue analizada mediante fotografía y reflectografía, y la intervención adoptó los protocolos establecidos por Artlab con los principales objetivos de realzar la estabilidad de la obra con un nuevo bastidor, restablecer la integridad del soporte textil, eliminar los parches de la vieja restauración, restaurar los estratos pictóricos y dotar a la pintura de protección para preservarla en el futuro.

La ejecución del proyecto se enriqueció por la interacción con procedimientos modernos de restauración dentro de un equipo profesional, y porque pudo contrastarse la formación teórica adquirida durante la licenciatura con la práctica de completar de principio a fin la restauración de una obra de arte.

PALABRAS CLAVE

ArtLab Australia, conservación, Francia, neoclasicismo, reentelado, reintegración

ACKNOWLEDGEMENTS

I thank my Spanish tutor Antoni Colomina for taking me on and his feedback during the undertaking of the project.

I am grateful to my Australian tutor Eugene Taddeo for accepting my internship application with Artlab Australia and for his teaching during the entire period of the internship. I am indebted with the Artlab team for their time to introduce me to their projects and the intricacies of working professionally in the field of art conservation and restauration. In particular, I am thankful to Mrs. Rosy Heysen for giving me access to the study portrait from her private collection

I thank Antonia Coca De Bartoli, Fine Arts Museum of Chambery Scientific Department Head, Professor Emilie-Anne Pepy, Senior Lecturer in Modern History in Savoy Mont Blanc University, for their help and collaboration in this project, both contributed to finding the identity of the painter and the person portrayed, and Max Carter for proof-reading the final version of this study.

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Last but not least, I am grateful to my uncle Salvador, the person who is most faithful that one day I will become a professional art restorer. Thanks for taking me by the hand through this journey that I will always remember. I will not stop fighting for my dream.

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PREFACE

This project is the result of a training internship with ArtLab Australia (www.artlabaustralia.com.au). Artlab is the government agency that provides expert services for the preservation and management of South Australia´s cultural assets and heritage to a range of national and international institutions and private art owners. ArtLab headquarters are located within the premises of the University of Adelaide – North Terrace Campus (South Australia).

Artlab Principal Conservator of Paintings Eugene Taddeo was contacted in May 2019 through Salvador Herrando Pérez (Celia José Herrando's uncle), who was a Research Associate with the University of Adelaide at the time. Celia moved to Australia in January 2020, attended a full-time English course with Vocational Education & Training between January and April 2020, and undertook the internship with ArtLab from June to October 2020 under the supervision of Taddeo and his team.

Overall, the internship consisted of two 10-hour practical sessions (Tuesdays and Wednesdays) in each of 10 consecutive weeks. The project covered a range of practical exercises addressing the restoration of aboriginal and contemporaneous paintings, and focused on the restoration of an easel oil-on-canvas portrait from 19th Century France (Figures 1 and 2).

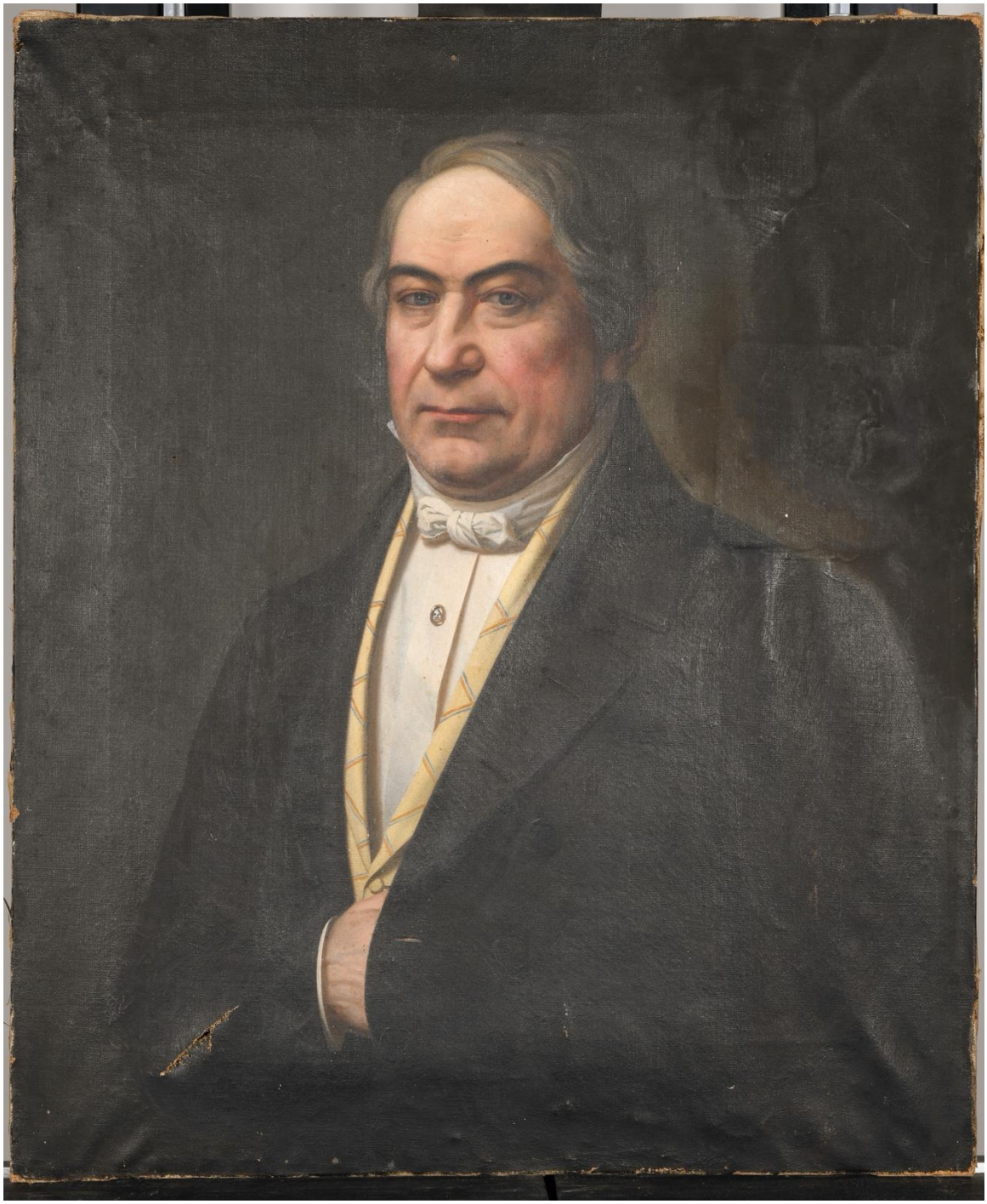


Figure 1. Foreside of the study painting under artificial light.

Figure 2. Backside of the study painting under artificial light.

1. INTRODUCTION

The conservation of cultural heritage aims to extend the lifespan of the structure and values of cultural assets[123]. It is often related to art and museum collections subjected to systematic conservation, documentation, exhibition and restoration as damage appears over time[4]. Art restoration emerged as a professional discipline in the early 20th century through the creation of the first specialized laboratories hosted by world-class art museums, such as Boston and the Louvre, in which painting art was a fundamental element[5].

Unlike other artistic manifestations, paintings have the particularity that its aesthetic and monetary values depend on the appearance and, therefore, on the state of conservation of a few millimetres of material (paint layers) on a surface (canvas)[6]. Restoration protocols vary according to the type of substrate supporting the paint layers (mostly, stone, metal, wood or fabric), the chemical composition of the paint layers and the age of the piece of art.

This Bachelor's Degree Final-Year Project ("Trabajo de Fin de Grado", TFG) addresses the restoration of an oil-on-canvas portrait painted in post-Napoleonic France in the early 19th Century (hereafter, "study painting"). This period coincides with the peak of neoclassicism, or the emphasis on austere linear recreation of classical antiquity[7], and romanticism, or the expression of an artist's emotions through his/her work. In France, the romantic conception of art was accentuated by the attribution of heroic connotations to individual achievements, brought to its highest expression in the historical character of Napoleon Bonaparte[8].

The study painting lacked author signature. The identities of both the artist and the portrayed man were investigated through a comprehensive literature review and communications with international experts specializing in 19th

[1] UNESCO, INSTITUTE FOR STATISTICS. (2009). *UNESCO Framework for Cultural Statistics*. Paris: The United Nations Educational, Scientific and Cultural Organization. Retrieved from: <https://unstats.un.org/home> [Date: 14/05/2021]
[2] STOVEL, H., (1998). *Risk preparedness: a management manual for world cultural heritage*. Rome: International Centre for the Study of the Preservation and Restoration of Cultural Property. Retrieved from: <https://www.iccrom.org> [Date: 14/05/2021]
[3] VIÑAS, V. and VIÑAS, R. (1988). Traditional restoration techniques: a RAMP study. Paris: The United Nations Educational, Scientific and Cultural Organization. Retrieved from: <http://uis.unesco.org/en/glossary-term/conservation-cultural-heritage> [Date: 08/05/2021]
[4] SZCZEPANOWSKA, H. M. (2013). *Conservation of cultural heritage: key principles and approaches*. Abingdon: Routledge.
[5] CLAVIR, M; PEARLSTAIN, E. (2018). *Museum Conservation. The International Encyclopedia of Anthropology*, pp. 1–9.
[6] ERHARDT, D. (2004). The art of restoration in *Nature*, vol. 431, pp. 410–411.
[7] IRWIN, D. (2018). *Neoclassical art*. In.: Encyclopedia Britannica.
[8] DOWD, D. L. (1951). "Art as National Propaganda in the French Revolution" *in Public opinion quarterly*, vol. 15 (3), 532-546.

Century French art and history. The restoration of the portrait involved (1) a preliminary conservation assessment using high-quality photography and reflectography, and (2) a restoration protocol following Artlab's technical and quality standards and complying with universal criteria of recognition, reversibility and respect. The project was successful to restore the stretcher, the canvas and the paint layers (ground, binder, pigments), which together form the main components of an oil on canvas[9].

2. OBJECTIVES

The overarching goals of the project were (1) to put into practice the theoretical and practical training received during the Bachelor's degree in Spain, and (2) to restore the study painting using the standard protocols of a professional team in Australia.

To accomplish the former goals, the specific objectives were:

(1) To identify the author and the person portrayed using the primary literature and communication with experts.
(2) To evaluate the damage of the study painting.
(3) To inventory the original materials of the painting.
(4) To assess the conservation status and implement a proposal of restoration based on Artlab's protocols.

3. METHODOLOGY

The project was completed in two phases: biographical (specific objective 1) and practical (specific objectives 2 to 4).

The biographical component rested on the review of primary and secondary literature using the database *Scopus* and *Google Scholar*, and personal communications with international academics, museum personnel and government agencies.

For the practical component, photography and ultraviolet/infrared reflectography and damage diagrams (*Procreate* software) were used to assess the different sources of damage in the study painting. Each pathology identified

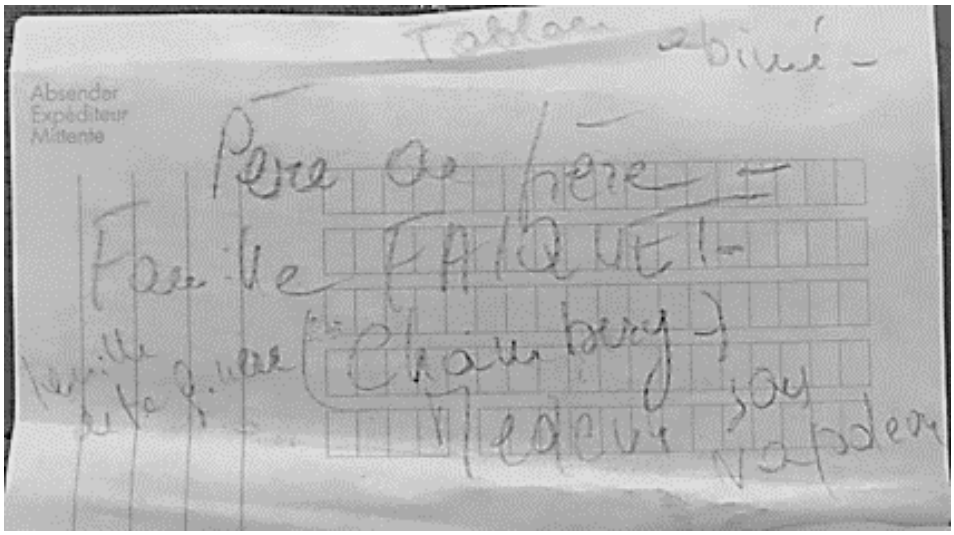
[9] LLAMAS PACHECO, R. *Introducción a la conservación y restauración de pinturas de caballete*. Valencia: Universidad Politécnica de Valencia.

was described and documented. The materials of the stretcher, canvas and paint layers were identified using a *Dino-Lite Edge 3.0* digital microscope (*DinoCapture 2.0 software*) with additional support from peer-reviewed restoration and conservation literature. Finally, the restoration protocol complied with international standards of curative conservation and restoration criteria and Artlab's canonical standards for easel paintings.

4. BIOGRAPHIC RESEARCH

4.1. SETTING

Artlab Principal Conservator Paintings Eugene Taddeo assessed the TFG's academic and training goals relative to the range of paintings the company had scheduled to restore in 2020 (see Preface). It was agreed that the internship and TFG would focus on a portrait (easel oil on canvas) belonging to the private collection of Artlab Paintings and Frames Conservator Rosemary Heysen. The names of the painter and the man portrayed were unknown. Heysen stated that the painting was brought to Australia by a relative from France. Additionally, the backside of the portrait had a piece of paper (Figure 3) with hand-written text in French stating that the painted man was a member of the family "Falquet" living in Chambery (Savoy, France) and somehow related to the French Revolution led by the military and political leader Napoleon Bonaparte.



"Tableau abîmé
Père ou frère
Famille Falquet
Neville site filière (Chambery)
Médecin sous Napoléon"

"Painting in bad quality
Father or brother
Family Falquet
Neville site filière
Doctor under Napoleon"

Figure 3. French and English versions of the hand writing in a note found on the backside of the study painting.

Four sources of information were investigated in order to unveil the identity of both the painter and the painted man, namely (1) the historical archives of the Fine Arts Museum of Chambery, (2) the Savoy Mont Blanc University Department of History, (3) the State Archives of Turin, and (4) primary and

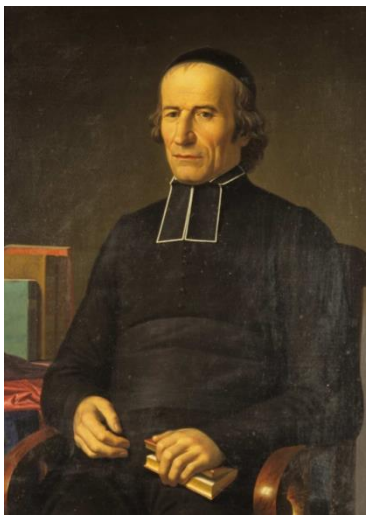


Figure 4. Portrait of Chanoine Dolin. Jacques Guille (1848). Oil on canvas, Bramans Church, Saboy (France).

Figure 5. *Monsignor Billiet.* Jacques Guille (1860). Oli on canvas. Fine Arts Museum, Chambery (France).

secondary research literature dealing with 19th Century's French art, clothing and history. All communications with professionals and institutions were done by email.

The Fine Arts Museum of Chambery was first contacted via their Facebook website and referred the request to their Scientific Department Head Antonia Coca De Bartoli. Based on a photo of the study painting and a brief description of its tentative historical context (Figure 3), Coca revised the Museum's historic records to track the set of painters who were practicing in Savoy during and around Napoleon's times. They comprised Jean-Baptiste Peytavin (Chambery, 1768-1855), Moreau Pierre-Emmanuel (Annecy, 1766-Chambery, 1833), Benoit Molin (Chambery 1810-Chambery 1894), and Jacques Guille (Saint Jean de Maurienne 1814 - Chambery 1873). A collection of paintings made by the four artists were collated from online sources, and their style was compared with that of the study painting, including overall facial features, body posture, and palette colour and background. The style and composition of the study painting tallied closely with Jacques Guille's *Portrait of Chanoine Dolin* (Figure 4) and *Portrait of Monseigneur Billiet* of 1860 (Figure 5). The conclusions of this comparative analysis were shared with Coca [10] and Taddeo, all reaching agreement that the most likely artist of the study painting was Jacques Guille.

Further feedback was obtained from Professor Emilie-Anne Pepy[11], Senior Lecturer in Modern History in Savoy Mont Blanc University (France). She was selected among a range of experts who were active historians with a strong publication record on 19th Century's French arts according to the bibliography database *Scopus* (www.scopus.com). Based on a photo of the study painting, its historical context and the surname "Falquet", Pepy related the painted man to the family of Magistrate Joseph Bernard Falquet. She confirmed that Guille's *protégé* Monseigneur Billiet and Magistrate Falquet were contemporaneous members of the Academy of Sciences, Fine Arts and Letters of Savoy, shared the same social circles with headquarters in Turin[12], and both Guille and Falquet had engaged with common activities in the former Academy[13].

The States Archives of Turin [14] provided two unpublished documents including biographical details of Magistrate Falquet and his family, neither being conclusive about a link between Falquet and Guille[15]. Unfortunately, the Venaria

[10] Antonia Coca-De Bartoli, Chambery Fine Arts Museum (pers. comm., 01/07/2020)
[11] Emilie-Anne Pepy, Savoy Mont Blanc University (pers. comm., 06/07/2020)
[12] Emilie-Anne Pepy, Savoy Mont Blanc University (pers. comm., 07/07/2020)
[13] PILLET, L. (1891). *Histoire de l'Académie des Sciences, Belles-Lettres et Arts de Savoie (1820 à 1860)*. Chambéry, France: Imprimerie Savoisienne.
[14] *Stefano Benedetto, State Archives of Turin (pers. comm., 13/07/2020)*
[15] *Stefano Benedetto, State Archives of Turin (*pers. comm., 30/07/2020)

Reale Palace in Turin did not hold any additional portrait or painting of Falquet that could have been compared with the study painting.

Following a *Scopus* literature search for experts in 19th Century's French clothing, emails were exchanged with Professor Sophie Kurkdjian[16] (Fashion Director of the Institute d´Histoire du Temps Présent, Centre National de la Recherche Scientifique, France)[17] and Ms. Kendra Cleave[18] (Fashion Historian and San Francisco State University Associated Librarian, USA). Cleave was unable to provide any useful information while, based on Falquet's vestment (collar, jacket, shirt) in the study portrait, Kurkdjian narrowed down Falquet's clothing to the period between 1833 and 1836.

Assuming that the man in the portrait was already in his 50s, and considering that none of Magistrate Falquet's sons could be that old in the early 1930s (see Section 4.3), nor could have reached the social prominence arguably required for being the subject of a painting, the collective pieces of evidence presented above strongly point to Magistrate Falquet as the painted man in the study painting.

Three scenarios were posited whereby Guille could have painted Magistrate Falquet given the social standards and protocols of (post)Napoleonic France:

(1) The painting could have been commissioned personally by Falquet himself, one of his relatives or an artist among Falquet's acquaintances.
(2) Falquet could have been painted in recognition of his professional achievements under official commission by the Savoy Government.
(3) The portrait might have been a form of *post-mortem* legacy. For instance, Guille painted Major-General Count Mouxy de Loches (another member of the Academy of Savoy) three decades after his death in 1837, only one year after Falquet had passed away.

In the next two sections, biographical excerpts of Jacques Guille and Joseph Bernard Falquet are described based on multiple communications with Emilie-Anne Pepy and Stefano Benedetto, and the publications by GENELETTI (1999), SOCIÉTÉ D'HISTOIRE ET D'ARCHÉOLOGIE DE MAURIENNE (1933) and PILLET (1891).

[16] Sophie Kurkdjian, Institut d'Histoire du Temps Présent –
Centre National de la Recherche Scientifique (pers. comm., 20/07/2020)
[17] www.ihtp.cns.fr, France
[18] www.18thcenturyhari.com, USA

4.2. JACQUES GUILLE (1814 – 1873)

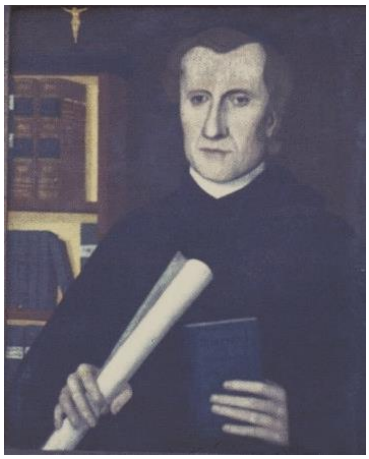


Figure 6. *Charles Jean-Baptiste Lamproz.* Jacques Guille (1832). Oil on canvas. Bramans Church, Savoy (France).

Figure 7. *Table XXIII "Arm muscles".* Jacques Guille (1836-1837). Lithography. Albertina Academy Library (Italy).

Jacques Jean-Baptiste Guille was born on November, 9th 1814 in Sant Jean de Maurienne, a French commune located in the department of Savoy (Auvergne-Rhône-Alpes). He died on December, 9th 1873 in Chambery at the age of 59.

He was the only male of four in a humble family. He studied at the Lambert College in Saint-Jean-de-Maurienne, where he received a classic education ingrained with Christian principles. Such a religious environment surely had a strong influence on the painter's entire career.

Teenager Guille became interested in the reproduction of paintings. His first pieces of work were a copy of "The Annunciation" by Gabriel Dufour (1640 – 1721) held at the "Bonne Nouvelle" Chapel in his home town[19], and an original portrait of Reverend Charles Jean-Baptiste Lamproz held at the Bramans Church, Savoy (Figure 6).

During the opening ceremony of the "Bonne Nouvelle" Chapel, after the rehabilitation of the structural damage caused by the military upheaval of the French Revolution, Guille's teacher Monsignor Jordain introduced Guille to Savoy's exclusive religious circles, including Canon Ambroise Angley who quickly detected Guille's painting talents.

Guille became Angley's protégé in 1831, immediately after Guille's father had died. Angley was concerned that Guille´s promising talents could go wasted on "mundane matters" such as looking after his mom and his three sisters. Thus, he endorsed Guille's enrolment with the Albertina Academy of Fine Arts in Turin in 1832 where he was supervised by Bishop Jordain and Monsignor Billiet.

During the first two years of training, the Albertina Academy's curriculum dictated that students combined their artistic training with lectures on basic anatomy, art history, poetry and the 'French School of Folds and Perspective'. In the final academic year, students could select an area of specialization among painting, sculpture, architecture and engraving. Guille of course chose painting. He copied paintings and drawings by the great Italian artists held by museums and churches in Turin. He won several prizes and shared the prestigious "Guy Foundation Award"[20] with Mr. Benoît Molin (1820 – 1910)[21]. Throughout, Guille received a rigorous neoclassical training in oil painting from renowned artists such as Giovanni Battista Biscarra (1790 - 1851), Luigi Bernero (1775 - 1848),

[19] Coincidently, in 1850 he restored this piece of art himself.

[20] Organized by the Academy of Savoy, the renowned "Guy Foundation" award was given to talented young poets and painters native to Savoy (Geneletti 1999, pp. 47-48)

[21] Retrieved from: <http://www.getty.edu/art/collection/objects/39402/nadar-gaspard-felix-tournachon-benoit-hermogaste-molin-french-1858>

Figure 8. *Monsignor Billiet.* Jacques Guille (1839). Oil on canvas. 150 × 130 cm. Sacristy Cathedral Saint John the Baptist, Saint-Jean-de-Maurienne (France).

Figure 9. *Monsignor Billiet.* Jacques Guille (1845). Oil on canvas. Chambery's Archbishopric, Chambery (France).

Figure 10. *Monsignor Billiet.* Jacques Guille (1865). Oil on canvas. 118 × 85 cm. Sacristy Cathedral Saint John the Baptist, Saint-Jean-de-Maurienne (France).

Giuseppe Monticoni (1769 - 1837), Giuseppe Pietro Bagetti (1764 - 1831) and Ferdinando Bonsignore (1760 – 1843).

In 1832, Francesco Bertinatti (1780 – 1840) was appointed new professor of anatomy at the Albertina Academy and, among his most talented students, recruited Guille to paint a set of 37 anatomical tables (see example in Figure 7). Aged 26, Guille finished his studies in 1839 with an overall score of 16 out of 20.

On completion of his studies, Guille returned to Chambery, plausibly by recommendation of his *protégé* Monsignor Billiet[22] (1783 - 1873). Billiet was one of the fathers of the Academy of Sciences, Fine Arts and Letters of Savoy (foundered in 1820). This institution endowed the Duchy of Savoy with an academy of undisputed reputation likened to that of Turin[23]. In his first three years in Chambery, Guille perfected his artistic skills with the Master of Painting Jean-Baptiste Peytavin (1768-1855) and the Master of Drawing Cavalero, and he later became the Master of Painting and Drawing himself. He remained in the former position until 1851, then took a teaching role in drawing until 1873. Throughout this period, Guille portraited Billet five times (Figures 8, 9 and 10) and was commissioned to paint portraits of many other local celebrities.

Ironically, Guille benefited from the destruction of churches by Napoleon's army as many religious buildings and their art collections required restoration. This practicality, along with Guille's catholic education and diverse acquaintances among canons, bishops and priests, determined the deep connection that he developed for Christian ideals. One of his favourite quotes, by Saint Augustine, said that "The Fine Arts are destined to lead man bring to God, eternal harmony, source of all good and all beauty".

Despite the many portraits that Guille made, he held strong opinions against realistic painting. In contrast, he was inspired by the classics such as Géricault, Ingres, Delacroix and David d'Angers, who sought their muses in the solemnity and historical memoirs of nature. A good friend of Guille, Louis Berthet, believed that Guille's artistic talent would have reached honourable national notoriety had he not been diverted by religious painting.

Among Guille's master pieces, in 1846 he painted a series of 14 oil on canvases showing Jesus' *Stations of the Cross*, currently held by the Church of

[22] Archbishop of Chambery (1840-1873), Bishop of Saint-Jean-de-Maurienne (1825- 1840) and Cardinal-Priest of Santi Bonifacio ed Alessio (1861). Retrieved from: <http://www.catholic-hierarchy.org/bishop/bbill.html>

[23] Emilie-Anne Pepy, Savoy Mont Blanc University (pers. comm., 06/07/2020)

Figure 11. *Le Pain de Mai.* Jacques Guille (1871). Oil on canvas. Saint-Pierre of Tartantaise Cathedral, Moutiers (France).

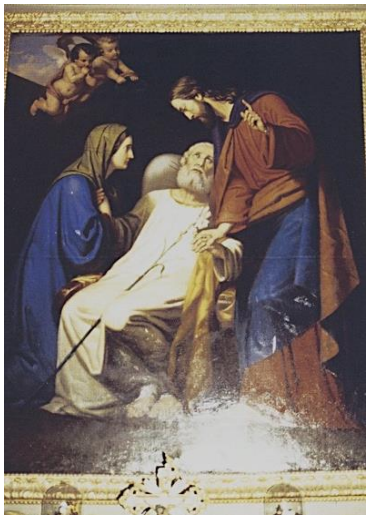


Figure 12. *The Good Death* (domestic picture). Jacques Guille (1873). Oil on canvas. Saint Joseph in the Church of Fontcouverte, Languedoc-Roussillon (France).

Notre Dame in Chambery[24]. In this series, he showed great command of the *chiaroscuro* technique developed by the Milanese painting school headed by artists such as Guido Campi and Girolamo Savoldo.

In 1858 Guille painted "Saint Maurice on horseback", a commissioned oil on canvas exhibited at the main altar of the Church of Saint Maurice in Orelle, Savoy, followed by 12 paintings representing each of the apostles. In 1871, he painted "Saint Peter II distributing May's bread", another oil on canvas for the Saint-Pierre of Tartantaise Cathedral of Moutiers (Figure 11).

Finally, in 1872 he accepted his last commissioned work entitled "The Good Death", representing Saint Joseph. This work has been exhibited at the altar of Saint Joseph in the Church of Fontcouverte, Languedoc-Roussillon (Figure 12). However, Guille fell ill and died in the making on 1873, leaving San Peter´s rope colourless. Before his death, his family and friends persuaded him that his fate was God's will: "Console yourself, my poor friend! If God does not want you to add one ultimate piece to your work, should not He grant you a greater grace, that of finishing it in action with a good death?".

4.3. JOSEPH BERNARD FALQUET (1776 – 1836)

Magistrate Joseph Bernard Baron Falquet was born on August, 19th 1776 in Annecy, the largest city in the department of Haute-Savoie (Auvergne-Rhône-Alpes, France). He received a religious education and showed a precocious vocation for jurisprudence. Falquet married Jeanne Louise Maurice (1784 – 1849) in 1800 and had 3 sons, François Falquet (1800 – 1873), Knight Camille Falquet (1804 – 1856) and Baron Ferdinand-Yves Falquet (1815 – 1861)[25]. He died at the age of 60 on February, 28th 1836 in Turin (Piedmont, Italy)[26].

Falquet studied in the Royal College of Chambéry, where he completed high school and his university degree. However, in 1792, the invasion of Savoy by Napoleon's troops, forced Falquet to move to Piedmont where he obtained a Doctorate in Law in 1796[27]. The fact that Falquet was the nephew of Senator

[24] Sequence of events portraying Jesus Christ from his condemnation by to his entombment. Retrieved from: <https://www.britannica.com/topic/Stations-of-the-Cross>
[25] Emilie-Anne Pepy, Savoy Mont Blanc University (pers. comm., 06/07/2020 and 01/08/2020)
[26] Emilie-Anne Pepy, Savoy Mont Blanc University (pers. comm., 06/07/2020)
[27] Emilie-Anne Pepy, Savoy Mont Blanc University (pers. comm., 18/11/2020)

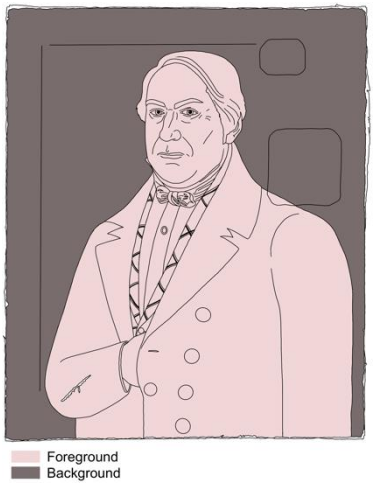


Figure 13. Composition diagram distinguishing the foreground from the background of the study painting.

Count Berthollet (1748-1822)[28] gave him rapid recognition in the financial and aristocratic circles. In 1804, he was appointed judge at the Tribunal of Annecy and, shortly afterwards, Counsellor of the Grenoble Court of Appeal. In 1818, he became Deputy Attorney General at the Chamber of Accounts in Turin and, three years later, Fiscal Advocate General at the Senate of Savoy.

In 1828, King Charles-Felix appointed Falquet First Secretary of State in the Ministry of the Interior in Turin, and from there he became Minister of Interior for the Sardinian States. In 1829, he entered the Academy of Sciences, Fine Arts and Letters of Savoy, while he received the Baron title in 1931.

Across the board, Falquet contributed to the improvement of mortgage legislation and the establishment of charity councils in Savoy. Arguably, his greatest achievement was his leading role in the creation of the Sardinian Civil Code.

5. PAINTING COMPOSITION AND STYLE

The study painting belongs to the portrait category, and depicts Magistrate Joseph Bernard Falquet in his 50s (section 4).

The composition consists of two elements: (1) the foreground shows the person portrayed in early 1800's French aristocratic customs, and (2) the background is homogeneous dark greenish, without depth, giving a strong sense of empty space (Figures 1 and 13).

Falquet is at the same visual level as the painter, and they seem to be at a short distance from each other. The compositional shape is triangular. Falquet is located in the centre of the painting, seated, in a three-quarter pose looking to the viewer. His left arm is relaxed and flexed with the right hand hidden under a black waistcoat. His gaze and facial expression are still. Such a posture evokes a psychological connection between the subject and the person looking at the portrait, and underlines the distinction of the character.

The scene is illuminated by a source of light directed to the left margin of the portrait. This light emphasizes Falquet's face as well as his shirt, collar and right hand as clear signs of additional distinction (Figures 1 and 14). This composition

[28] Claude-Louis Berthollet was one of the greatest French chemists of the 18th Century. Berthollet determined the composition of alkaline gas, prussic acid and hydrogen sulfide. And he was close to Napoleon Bonaparte (1769-1821) and both travelled together and joined efforts to create *L'Institut d'Égypte* (The Institute of Egypt) in Cairo (Egypt). Retrieved from: <https://riviste.fupress.net/index.php/subs/article/view/879/698>

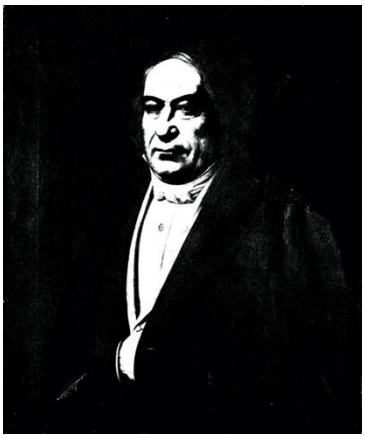


Figure 14. Light and dark areas of the study painting edited in the *Procreate* software using the "threshold effect".

fits in a chiaroscuro design whereby the background dark tones contrast with the complexion of Falquet's body.

The colour of the palette is dark with a predominance of black tone and a gradient of brownish greens, greyish in Falquet's hair, pink in his skin, white in his shirt and collar, and pale yellow in his waistcoat (Figure 14).

6. TECHNICAL ASPECTS AND CONDITION REPORT

The stretcher's wood was brittle and splinted. The backside of the canvas was torn and stained with oxide, the fabric lacked tension and the paint layers had been altered by a previous restoration. Old paintings typically experience mechanical stress caused by shifting humidity and temperature with the passage of time, and canvases and paint layers react to these changes in different fashions like bulging, contracting and cracking (Nicolaus 1999). All those alterations occurred in the study painting (Figures 1 and 2), and were detected in the analyses of damages of the foreside (Figures 15a and 16a) and backside (Figures 16a and 16b). Damage analysis is expanded in Appendix I.

The descriptive features of the painting are described in Table 1 and further detailed in Appendix I. The following three subsections detail the state of the structural materials and the stretcher (subsection 6.1), the canvas (subsection 6.2) and the paint layers (subsection 6.3) prior to restoration.

TITLE	Magistrate Joseph Bernard Falquet
AUTHOR	Jacques Guille (attribution)
DATE	Early 19th Century
PROVENANCE	France
COLLECTION	Private
DISCIPLINE	Portrait
TECHNIC	Oil on canvas (easel)
SUPPORT	Textile (linen)
FRAME	No
SIGNATURE	No
MEASUREMENTS	63,5 cm × 53,2 cm × 1,5 cm

Table 1. Descriptive features of the study painting.

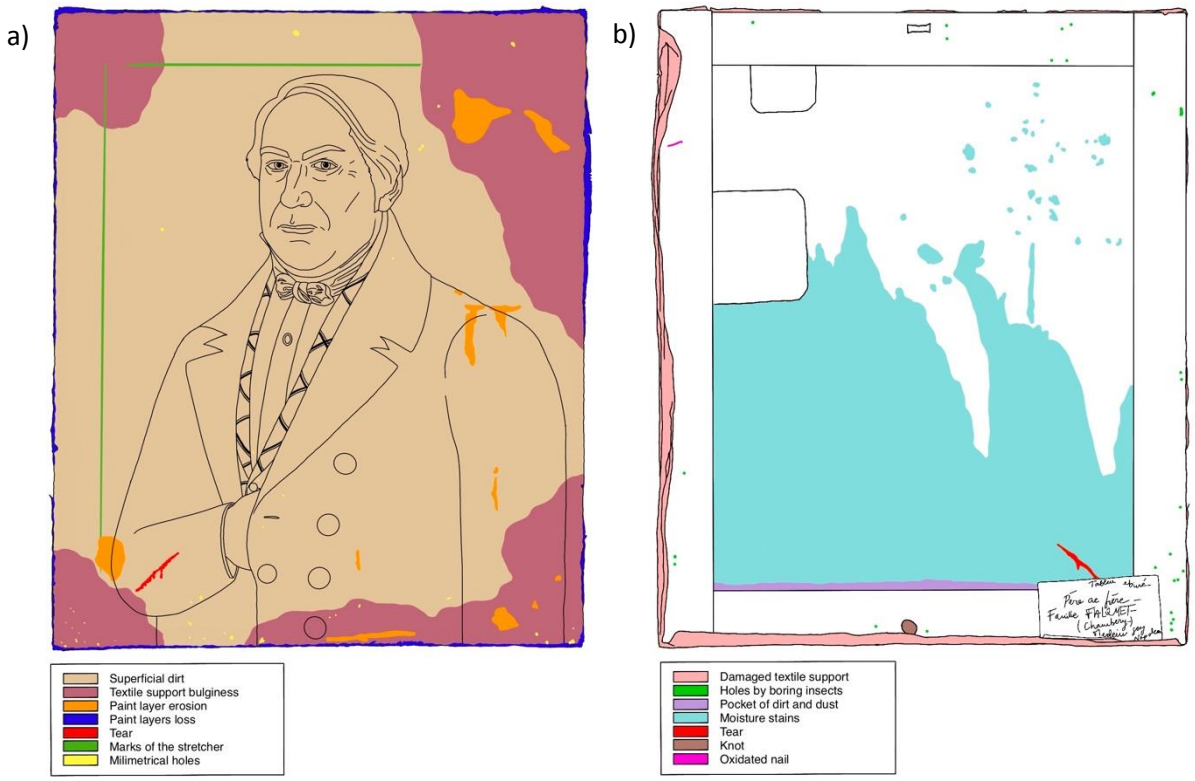


Figure 15. Damage diagram caused by the environment in the a) foreside and b) backside of the study painting, created with *Procreate* software.

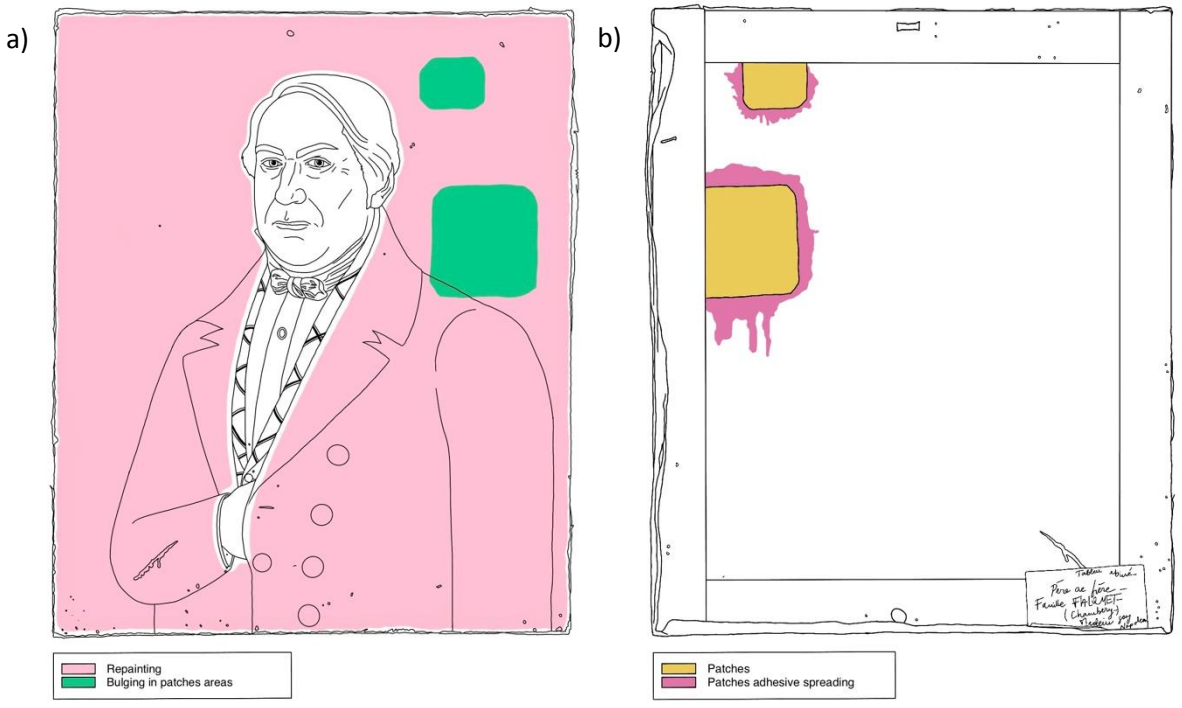


Figure 16. Damage diagram caused by an old restoration in the a) foreside and b) backside of the study painting, created with the *Procreate* software.

6.1. STRETCHER

6.1.1 Structural materials

The stretcher was rigid[29], rectangular in shape (63,3 cm × 53 cm) and made up of four wooden bars (5,1 cm wide × 1,2 cm thick). The wood showed growth rings typical of coniferous trees. The stretcher's assembly consisted of a standard blind mortise and stub tenon (Figure 17), and its corners lacked wedges typical of a strainer. The bars were stuck together with animal glue and metallic spikes. There was no central supporting bar.

The canvas was attached to the stretcher by means of flat-headed iron nails (Figure 26) placed at random distances from one another. The nails had been hand-forged as they differed in size, head shape and shank length and thickness. They showed intense oxidation, and were slightly curved as if they had been driven manually into the bars of the stretcher with a hammer.

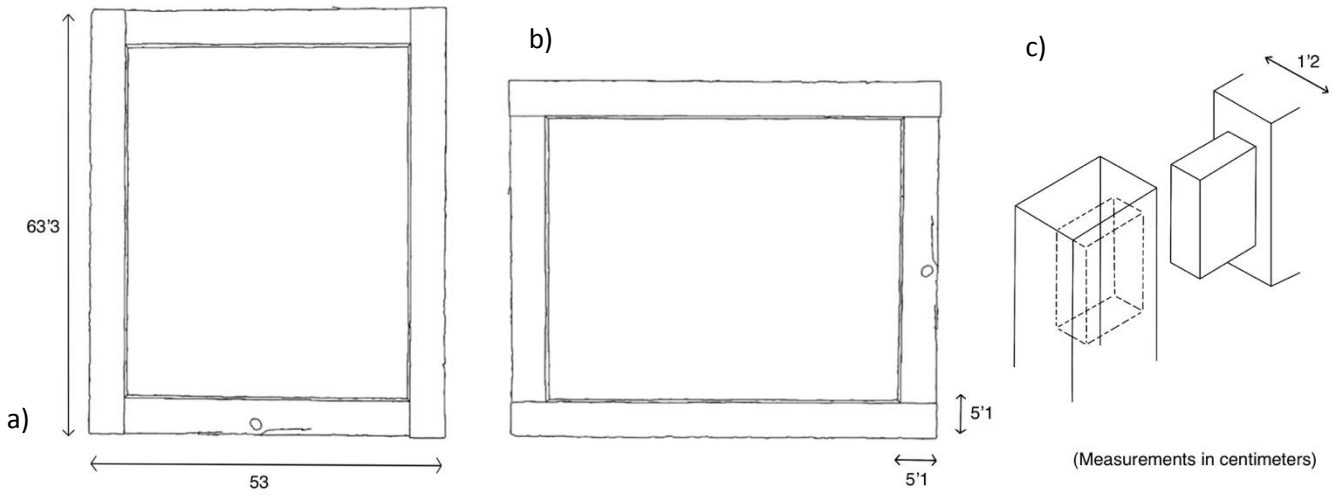


Figure 17. Measurements of the old stretcher in centimetres: a) frame length and width, b) bar width, and c) assembly of bars.

6.1.2. Condition

The surface of the stretcher was scratched and showed multiple holes made by boring insects[30] (Figure 18a). The edges of the bars were splinted along their entire length. The bottom bar was chipped and cracked, and had an unsound knot (Figure 18b). There was a modern flat-headed iron nail in the upper part of the left bar, whose function is unknown (Figure 18c), and a metal hook in the upper bar very likely for wall hanging (Figure 18d).

[29] Known as 'strainer' in restoration terminology.

[30] Based on the size and morphology (i.e., circular in section and about 2 mm in diameter), the holes are likely to have been bored by the common house beetle *Anobium punctatum*.

The stretcher had no nail-made empty holes but showed marks of humidity, while the space between the stretcher and the backside of the canvas had accumulated a homogeneous layer of dust and dirt. Those features collectively support that the stretcher was original and must have been mounted only once.

a) b) c) d)

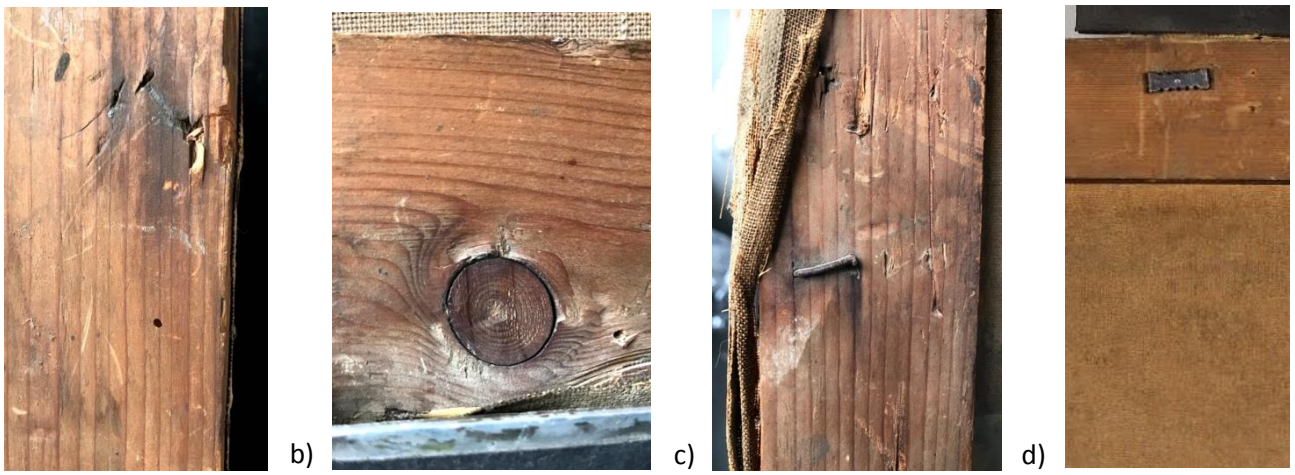


Figure 18. Examples of damages found in the stretcher of the study painting: a) a hole produced by the common furniture beetle *Anobium punctatum*, b) unsound knot and humidity spots, c) modern flat-headed iron nail, and d) metal hook in the upper bar.

6.2. CANVAS

6.2.1 Structural materials

The surface of the canvas had been cut in an irregular way and was approximately 67 cm long and 57 cm wide.

The fabric was inferred to be made up of linen by testing the thermal behavior of two threads (2 cm in length each). These threads were carefully extracted from one of the unpainted edges of the canvas. One of the threads was in vertical direction and the other in horizontal direction. The following two tests were applied with the aid of the flame of a gas lighter:

(1) Burning: when approached to the flame, the end of the threads ignited and scorched rapidly. The flame was yellow and smelled like burnt paper and feathers, indicating the presence of cellulose fibers[31].
(2) Twisting: a fiber from each of the threads was moistened in deionized water for 30 seconds. When slowly approached to the flame, each fiber turned clockwise, indicating linen content[32].

[31] CORBMAN, B. P. (1979) *Textiles, fiber to fabric, Canadian Edition , SI Metric*. Canada: McGraw-Hill Ryerson. pp. 23-24.
[32] CAMPO, G., BAGAN, R. AND ORIOLS, N. (2009). *Identificació de fibres. Suports tèxtils de pintures: metodologia*. Barcelona: Tallers Gràfics Hostench. p. 12.

The material of the canvas was plain weave[33] (Figure 19a) without seams or selvage. The warp must be thicker and have more twist than the weft for the canvas to withstand more tension[34], but the absence of selvage precluded the differentiation of warp and weft in the study painting.

a)  b) 

Figure 19. Textile support and plain weave of the study painting using the *Dino-Lite Edge 3.0:* a) thread and b) weave.

The yard was coarse and dark brown (Figure 19b), had a regular weave and showed a series of small knots all over the surface of the canvas. Using the *Dino-Lite Edge 3.0 Digital Microscope* (DinoCapture 2.0 Software), the twist direction of the yard was discerned to be "S" with an angle of 20 degrees. Yard length varied from 0,3 to 0,5 mm. The number of threads in the yard were counted ten times, giving an average of 19 (vertically) and 17 (horizontally) threads per cm^2.

6.2.2. Condition

The fabric of the canvas had a weak and brittle consistency. It was loose and had bulged from exposure to humidity, changes in temperature and lack of tension. The edges were torn, had pieces of missing textile (Figure 20) and showed oxide deposits in the form of little circles around the supporting nails (subsection 6.1.1). In the bottom-left corner of the canvas, there was a tear 5,9 cm long with a vertical ramification 1 cm long.

Figure 20. Damage in the edges of the canvas of the study painting.

The canvas backside was covered by a thin layer of dust and dirt punctuated with traces of moisture. The stretcher had imprinted a series of continuous grooves along the canvas margins. The top-left, center and right-bottom regions of the canvas presented numerous holes, about 0,1 cm in diameter each. Two patches of hard material from a previous intervention seem to cover a number of holes in the fabric (see below).

[33] Plain weave is sometimes referred to as tabby, homespun or taffeta. On the loom, it requires only two harnesses, and each filling yarn goes alternately under and over the warp yarns.
[34] CAMPO, G., BAGAN, R. AND ORIOLS, N. *Op. Cit*., p-9

Figure 21. Backside view of the patches from a previous intervention of the study painting.

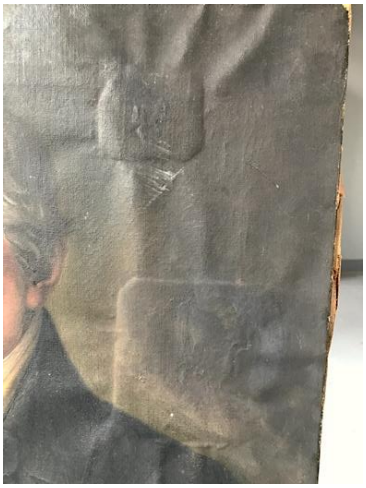


Figure 22. Foreside view of the patches from a previous intervention of the study painting.

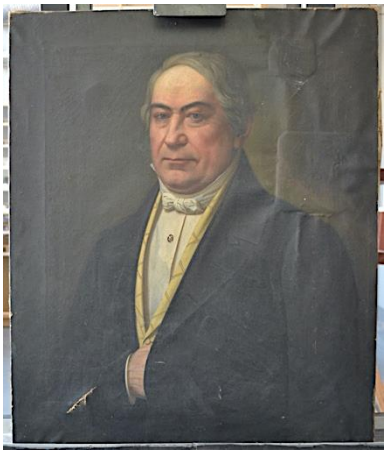


Figure 23. Foreside of the study painting showing a surficial layer of dirt.

The canvas foreside and the paint layers showed two rectangular protrusions caused by the old-restoration patches (Figure 1). The smaller patch (6,35 × 5,65 cm) was located in the upper-left of the portrait close to the top bar near Falquet's head, and the larger patch (10,85 × 11,15 cm) was located in the center-left of the portrait close to the right bar near Falquet's neck (Figures 21 and 22, respectively).

6.3. PAINT LAYERS

6.3.1 Structural materials

The painted surface consisted of a preparation layer that was fairly thin and greyish to beige in color. The ground pigment of the filler appeared to have been bounded with animal glue. Both the ground and the filler were visible through the edges of the canvas, suggesting that the portrait had been primed before being stretched[35].

The paint had been deployed in a thin layer devoid of texture. Infrared radiation did not detect any type of preparatory underlying drawing[36]. The predominating pigments were browns and greens.

6.3.2. Condition

Dust and dirt particles, possibly deposited from the air surrounding the portrait, were scattered all over the painted surface (Figure 23).

The old restoration had eroded the paint layers and the overlying varnish, especially in the light-colored areas of the portrait such as the head and the collar. A thin layer of varnish was restricted to Falquet's jacket and the right side of his head (Figure 24). Abundant repainting in Falquet's background (Figure 24) was detected under ultraviolet fluorescence. This repainting covered three areas, two were rectangular (1,7 cm × 2,5 cm and 7,3 cm × 10,16 cm, respectively), and one was circular (diameter = 0,8 cm) in shape. The overfilling was greenish-grey and had a hard constitution (Figure 25).

The paint layers had many cracking marks triggered by changes in temperature and humidity, which were only visible at a close distance. These marks were particularly abundant in the upper-left region of the canvas, near

[35] During the 19th Century, the trade of painting materials experienced industrialization, and ground fabrication and implementation started to be carried out by commercial manufacturers.
[36] See Appendix I to appreciate Infrared light photography.

the tear (bottom-left) and around the old-restoration patches. The edges of the canvas had bulged gently and showed some discoloration.

Figure 24. Foreside of the study painting under ultraviolet reflectography.

Figure 25. Removing re-painting from an old restoration unveiled the stucco of two patches in the upper-right region of the study painting.

7. RESTORATION PROTOCOL

The restoration protocol applied to the study painting followed Artlab Painting Conservation Department's canonical procedures, and was completed in four steps described in the following four sections.

7.1. REMOVAL OF OLD STRETCHER

Figure 26. Sample of flat-head iron nails used to attach the canvas to the bars of the stretcher of the study painting.

The stretcher was no longer performing its supporting function and, therefore, was replaced with a new one (section 7.4). To dismantle the old stretcher, the iron nails (subsection 6.1.1; Figure 26) were extracted from the canvas and the bars of the stretcher with the aid of a screwdriver and pliers, and all the bars were then separated from the canvas. This action was taken with extreme care as the nails were rusted and fragile, and the stretcher (subsection 6.1) and canvas (subsection 6.2) were brittle.

7.2. CANVAS

7.2.1. Removing patches from old restoration

The two patches (subsection 6.2.2) were made up of thick cardboard mounted in two layers. The lower layer had been adhered to the canvas with dark-green animal glue, and both patches were camouflaged under a thin coat of dark green-to-brown paint. Removal of the patches was done before replacing the old stretcher with the new one (section 7.4) in four steps:

(1) A scalpel was inserted between the two cardboard layers of each patch (Figure 27a) and repeatedly twisted up and down. The border of the cardboard was pinched with metal tweezers, and a piece of the lifting cardboard was gently pulled and torn off (Figure 27b). This process was repeated until the entire top layer of every patch had been removed (Figure 27c).

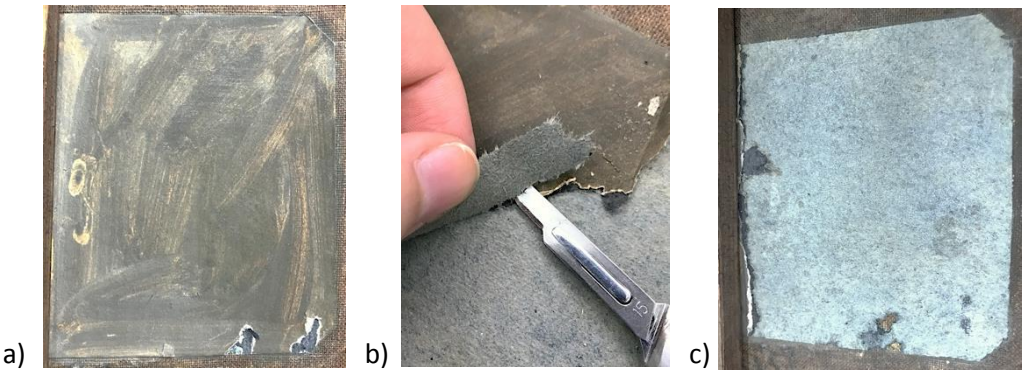


Figure 27. Removal of the upper cardboard layer of the larger patch from an old restoration of the study painting: a) testing the scalpel, b) during the removal process, and c) top layer removed.

(2) The bottom layer of the cardboard was wetted with a thin brush soaked in deionized water. After 2 minutes, the animal glue had softened. The cardboard was then removed in ~1 × 1 cm^2 fragments using a scalpel gently pointed in a slightly angled position at the space between the cardboard and the canvas (Figure 28).

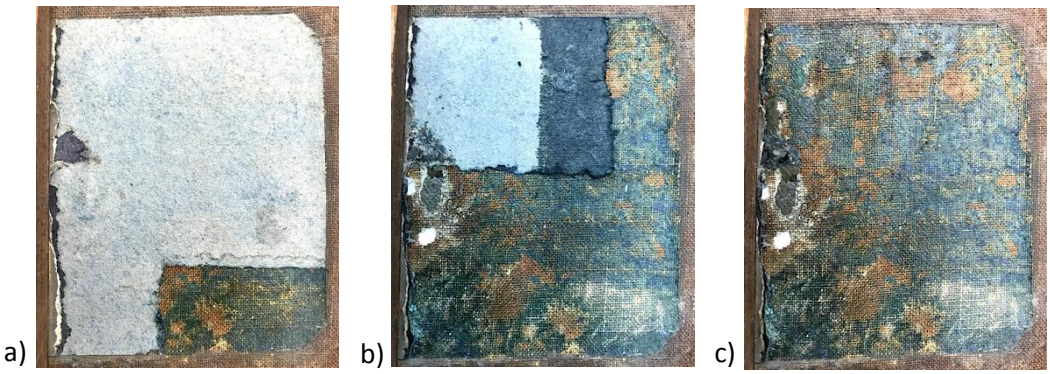


Figure 28. Removal of the lower layer of cardboard of the larger patch from an old restoration of the study painting: a) first area removed, b) half of the area removed and c) completely removed.

(3) When the patches were completely dry, the excess of animal glue was scrapped off with the scalpel. Some glue was profusely intertwined with the threads and fibers of the fabric and could not be removed.

(4) The larger patch had been used to cover three holes in the canvas, of which only the largest hole was filled with stucco (Figure 28c). A thin brush soaked in mild deionized water was used to soften this stucco. After 3 minutes, the filling was carefully removed with the scalpel and metal tweezers. The smaller patch was covering a rounded hole also filled with stucco, which was not removed because it was firmly embedded in the fabric of the canvas.

(5) Steps 1 to 3 above were taken to remove the portions of the patches hidden under the stretcher once the stretcher had been dismantled (subsection 7.1) (Figures 29 and 30).

a)  b) 

Figure 29. Larger patch from a previous intervention of the study painting: a) before and b) after removing the stretcher (portrait backside).

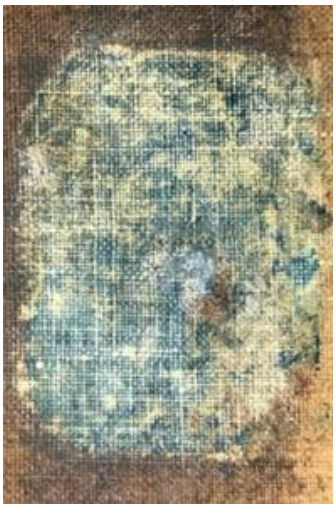


Figure 30. Smaller patch from a previous intervention of the study painting (portrait backside).

A pocket of dirt, dust and tiny pieces of wood had accumulated in the space between the bars of the stretcher and the margins of the canvas folded over the stretcher (Figure 31), particularly in the bottom bar. Such material was scrapped using a palette knife, then brushed and a vacuumed. The canvas margins were covered by a Mylar[37] and then compressed with an 80°C-hot spatula (hereafter "hot spatula" implies 80°C). This pressure flattened the bulging of the perimeter of the canvas, including the tear in the bottom-left margin (Figure 32).

[37] Made by DuPont Teijin Films and recognised as the standard film for painting restoration worldwide. The chemical composition of Mylar is polyethylene terephthalate. It has a neutral pH, is free of plasticisers, catalysts and solvents, and remains stable over time.

Figure 31. Pocket of dirt, dust and wood fragments found between the canvas and the bottom bar of the stretcher of the study painting.

Figure 32. Canvas backside of the study painting after cleaning.

7.2.3. Attenuating patch bulging

Figure 33. Weight bags placed over a glass screen to attenuate canvas bulging of the study painting.

To relax and flatten the bulging of the fabric that the old-restoration patches had caused (subsection 7.2.1), the surface of each patch was covered with a cellulose sheet (half a centimeter larger than each patch surface) coated with deionized water. Two weight bags over a glass screen were then applied on each patch for 3 minutes (Figure 33). The cellulose sheets were replaced with dry ones, and weight bags were placed again on each patch and removed after 24 hours.

7.2.4. Stabilizing tear

The tear in the bottom-left of the canvas was stabilized with Lascaux welding powder[38]. A drop of this resin was applied to the edges of the tear with a scalpel and the resin was melted with a hot spatula pressed upon a Mylar. The tear was allowed to cool down, and the same process was repeated until covering the whole surface of the tear. Finally, one cellulose sheet was used to flatten the bulging of the tear as described above for the surface of the patches (subsection 7.2.3).

[38] This thermoplastic resin is customarily used as an adhesive in textile and leather clothing, and is also popular in painting conservation (melting point = 93-103 °C).

7.2.5. Flattening fabric

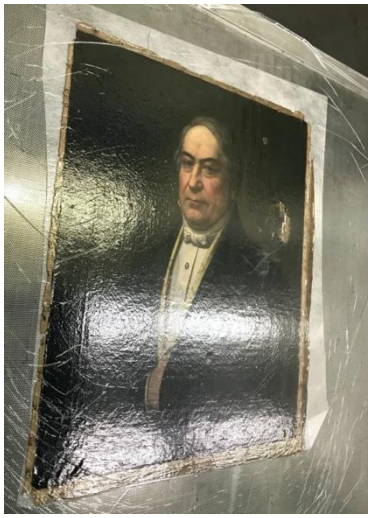


Figure 34. Canvas of the study painting after flattening on the heat/vacuum table.

In order to facilitate the lining of the paint layers (subsection 8.2.7), the canvas was flattened by covering its entire surface with a Stabletex[39] sheet and a Mylar sprayed with deionized water (Figure 34). The canvas was then placed on a heat/vacuum table, and the table was heated up to 50°C in 20 minutes, maintained at that temperature for 3 minutes, then cooled down to 25-30°C in 60 minutes. Subsequently, a glass panel was placed on a Mylar to stabilize the fabric affected by the old-restoration patches.

7.2.6. Adding inlay to holes under patches[40]

Figure 35. Gluing the fabric inlay to the canvas of the study painting using a brush impregnated with Lascaux Welding Powder.

A fabric inlay was added only to the larger patch covering the three fabric holes under the larger old-restoration patch (subsection 7.2.1). The silhouettes of these holes were first drawn in Japanese paper. A fragment of ground-covered fabric was taken from the margins of the canvas. This fragment was cut in three pieces, and each piece was trimmed in a shape that matched the silhouette of each of the three holes. The threads of each piece were aligned with the threads of the canvas fabric surrounding the holes. Lastly, the perimeter of each piece was trimmed and glued to the canvas with Lascaux Welding Powder (Figure 35) following the same methodology used above to stabilize the canvas tear (subsection 7.2.4).

7.2.7. New lining

The new lining was done in three layers that were added to the canvas backside in the following order:

(1) The entire surface of the canvas was brushed with a thin coat of a mixture of 10% Beva 371 solution[41] and 40% White Spirit[42], and allowed to dry for 24 hours. This layer percolated through the paint layers and enhanced their resistance for the next lining.

(2) The backside of the canvas was covered with a sheet of 10% Beva 371 film[43] (with 2 cm of margin exceeding the dimensions of the canvas). Using a large hot spatula, and interposing a Mylar, heat was applied to the canvas backside to activate the adhesive. The activation was done

[39] Stabletex is a polyester-made thermally-bonded membrane with high porosity.

[40] In Spanish, inlays are equivalent to "injertos a unión viva".

[41] Beva 371 solution (Berger ethylene vinyl acetate) is a mixture of ethylene viny lacetate, paraffin, ketone resin, and aliphatic and aromatic solvents. It is widely used for painting lining on a hot/vacuum table (or lining iron and vacuum), flaking, facing and any kind of sizing intervention.

[42] White Spirit is made up of hydrocarbon petroleum distilled at temperatures of 150-200 °C.

[43] Beva 371 sheet is a dry film made of a pure solution of Gustav Berger's O.F. 371. It is solvent-free, and widely used for transparent linings. It can be sandwiched between a silicone-coated paper and a silicone-coated polyester sheet for precise cutting. The sheet adherence can be activated with heat or solvents (being reversible with certain types of solvents).

from the center towards the sides then the corners of the canvas, without exerting any pressure other than the spatula's own weight. Once the Beva film had adhered to the fabric, the excess of film was trimmed with a scalpel, and the Mylar was removed.

(3) The ArtLab team recommended the use of Polyester Sailcloth[44] as the final lining. The painting was placed on the heat/vacuum table. Subsequently, the painting and the Sailcloth lining were placed over a Stabletex sheet, and everything was covered with a Mylar. The temperature of the heat/vacuum table was increased up to 80°C in 20 minutes (the Beva 371 sheet melts at 68°C[45]), maintained at that temperature for 3 minutes, and allowed to cool down to 25-30°C in 30 minutes. Weight bags were placed over each of the two old-restoration patches for 1 hour. Finally, any traces of adhesive were removed from the painted surface by gently wiping cotton swabs moistened in 40% White Spirit.

All solvents had evaporated after 2 hours from the placement of the new lining. However, some areas showed small air bubbles. These bubbles were removed by pressing a hot spatula against them. A glass sheet 1 cm thick was placed on the canvas backside until the lining and the canvas were cold. After that, all bubbling had disappeared.

7.3. PAINT LAYERS

The paint layers were 1 mm thick, profusely eroded, partially altered by the repainting of the old restoration, and extensively cracked (section 6.3.).

7.3.1. Cleaning surface

Following a solubility test with different chemical agents and concentrations, tri-ammonium citrate (TAC) in deionized water was selected for the cleaning of the surface of the portrait. Dirt and old-restoration repainting were removed with a swab moistened in 2,5% TAC. 3% TAC was needed to remove the thicker repainting covering the old-restoration patches (Figures 36 and 37).

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[44] Polyester Sailcloth is a fabric commonly used as a lining support. Some of its properties include low stretch, good elastic recovery, lightness, durability, low water-absorption, good abrasion resistance, acid resistance, reasonably isotropic behavior, and excellent bonding properties. It is offered as a stiff lining support which will reduce strains and stresses within a painting while retaining the flexibility of a fabric support.

[45] CTS Srl. *Gustav Berger's original formula 371*. Retrieved from: < https://shop-espana.ctseurope.com/362-gustav-bergers-original-formula-371-beva-371> [Date: 18/06/2020].

a)  b) 

Figure 36. Removal of the repainting from the old-restoration patches: a) smaller patch during removal and b) larger patch during removal.

Figure 37. Portrait foreside after repainting removal.

Figure 38. Colour and texture of the re-filling material, along with the tip of the scalpel used for re-filling.

7.3.2. Removing patch filling material

The portrait was placed horizontally on the workshop table, with the paint layers facing upwards, and within a frame of foam board. Carbopol solvent gel[46] was used to soften the filling material of the two old-restoration patches. A thin layer of this gel was gently brushed over the patches and allowed to act for 5 minutes. The gel was wiped off with a cotton ball and the overfilling was removed using a scalpel. Any traces of gel were removed with a swab moistened in ethanol in turn dissolved in 40% White Spirit.

7.3.3. Re-filling paint layers

The ground of the painted layers was re-filled in the damaged regions of the canvas, including the holes covered by the old-restoration patches (subsections 7.2.1 and 7.2.6) and the canvas margins (including the tear; see subsections 7.2.2 and 7.2.4). The re-filling material was handmade of a mixture of beehive wax[47], calcium carbonate, stand oil[48] and ketone resin with elastic consistency (Figure 38), normally used in Artlab. This method and this stucco were chosen because they were easy to work with, malleable and elastic.

The re-filling material was melted with a hot spatula, added to the damaged regions of the fabric and texturized with a scalpel. Re-filling excess was wiped off with a cotton swab moistened in 40% White Spirit.

[46] Carbopols are a dispersion of solvent in gelatinous materials able to hold or retain them, thus avoiding their penetration into the paint layers and limiting their evaporation rate. They are characterized by thickening properties and able to disperse a large number of organic solvents.
[47] Beeswax is produced by many species of bees, predominantly the honey bee *Apis mellifica*, and has been used in painting art since historical times. Melting point: 60-70 °C.
[48] Stand oil is thickened linseed or poppy oil heated to over 250°C in the absence of oxygen, and routinely used bound to ground pigments in painting restoration.

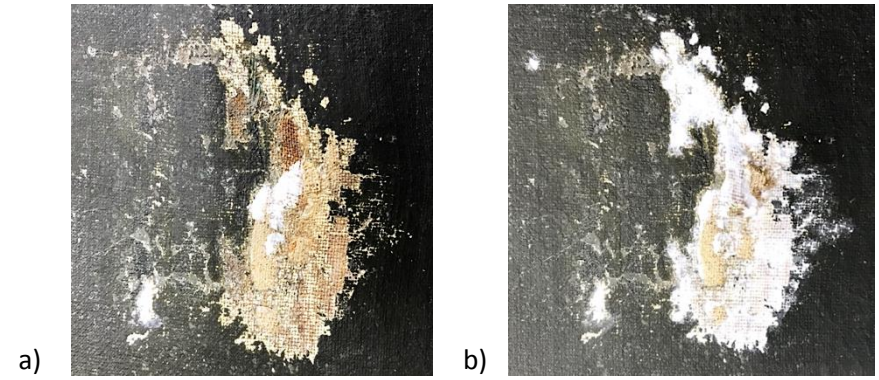

Figure 39. Paint layers of old-restoration patch a) before and b) after re-filling.

Figure 40. Colour palette showing the pigments used for the reintegration of the study painting.

Figure 41. Areas containing the old-restoration patches after the reintegration of the paint layers of the study painting.

The added re-filling material was brushed over with Paraloid B-72[49] resin moistened in xylene[50]. Xylene makes the resin fluid and thin, and thus facilitates penetration through the re-filling material. All solvents had evaporated after 1 hour and the re-filling material was consistent and dry (Figure 39).

7.3.4. Adding first varnish layer

The whole surface of the paint layers was varnished with the aid of a flat brush from the center to the sides and the corners of the canvas. The varnish was made up of Dammar (20 %) and gum turpentine (80%), and was used to isolate the paint layers from the external environment.

7.3.5. Reintegrating paint layers

The reintegration of the paint layers was done by means of 16 pigments (Appendix II) and a binder consisting of a mixture of Dammar varnish, pure gum turpentine and microwax (Figure 40). Pure gum turpentine was further used to reduce the brightness of the Dammar varnish during the reintegration[51].

The Artlab team recommended the pointillism technique for slowly building the colours during reintegration. Pointillism was applied (in this order) to the two patches, the tear and margins of the canvas, Falquet's face, and the minuscule holes found over the entire surface of the portrait (Figure 41).

[49] Paraloid B-72 is a thermoplastic resin extensively used in art restoration because it is transparent when dry, endures ageing and has low tendency to cross-linking. This resin remains highly soluble with the passage of time, which facilitates reversibility in restoration interventions.
[50] Xylene (xylol, dimethylbenzene) is an aromatic hydrocarbon, $C_6H_4(CH_3)_2$, soluble in alcohol and ether, and insoluble in water, and used as a solvent of alkyd resins, lacquers and industrial enamels.
[51] The list of pigments used is presented in Appendix II.

A new layer of varnish was sprayed over the portrait to seal the reintegrated paint layers. This final varnish was a mixture of Dammar varnish (10%), gum turpentine (80%) and microwax (10%).

7.4. NEW STRETCHER

To avoid cracking and tearing of the paint layers during the assemblage of the new stretcher, the full perimeter of the canvas was gently softened with a hot spatula, causing the edges of the canvas to curve.

Alternative to a fixed frame, the Artlab team posited that a four-bar wedged stretcher was the best option for the study painting as it can be disassembled and repaired easily. The new stretcher was made up of cedar, and had the same dimensions as the original stretcher (63,3 × 53,0 cm) (Figure 42a). The bars were 7,0 cm wide and 2,2 and 1,6 cm thick on the outer and inner sides, respectively (Figure 42b). Such asymmetry in thickness minimized the area of contact between the canvas and the stretcher. The four bars were ensembled with the aid of a hammer.

The stretcher's assembly was of the French type, with a mortise tenon and a double-miter joint with wedges (Figure 42c).

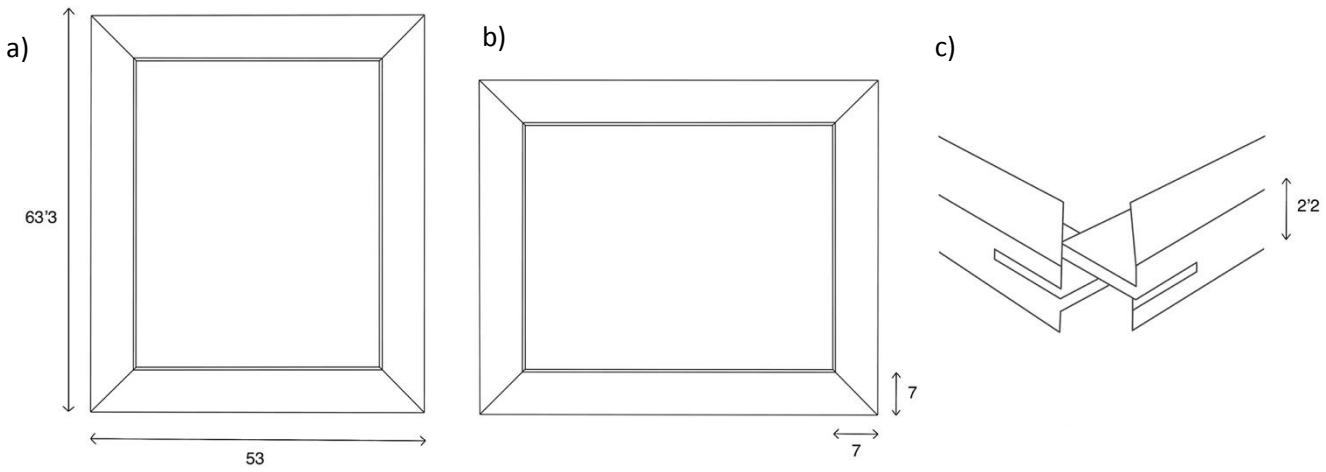

Figure 42. Measurements of the new stretcher in centimetres: a) frame length and width, b) bar width, and c) assembly of bars.

The painting foreside was covered with a Mylar, and rested upside down on the bevelled edges of the stretcher. The canvas was gently stretched by inserting several pins through the fabric and into the backside of the bars three times (Figure 43). In each of those times, the alignment between the stretcher and the canvas was gently adjusted until the alignment was perfect.

Protective pure-cotton heading tape (1,2 cm wide) was pinned along the edges of the canvas (Figure 43). The canvas was attached to the backside of the

bars of the stretcher with staples. The staples were inserted in a slightly curved angle with an airgun over the length of the heading tape (Figures 44 and 45). One single staple was inserted at the centre of each bar. Using the former staples as a reference, a series of staples were inserted 2 cm apart from each other from the centre to the end of each bar, after which all the security pins were removed.

The margins of the canvas protruding beyond the borders of the stretcher were trimmed, and the trimmed margins were folded and stabilized using further staples.

A hole was made with a screwdriver on each of the eight wedges, and a string was introduced through the hole and stabilized with a lark head knot. Each pair of wedges was tapped with a hammer into each of the four inner corners of the stretcher (Figure 44), and each string was secured to the stretcher with a staple and a double knot (Figure 45).

Figure 43. Temporary stretching of the canvas of the study painting using security pins.

Figure 44. Tapping the wedges with a hammer into the bars of the stretcher of the study painting.

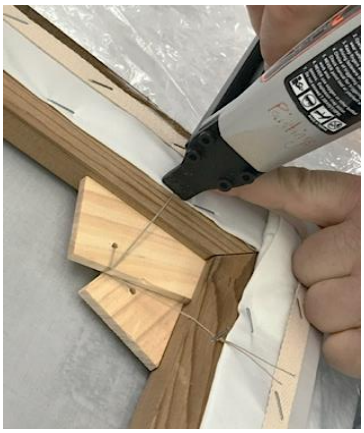

Figure 45. Stapling the wedges to the stretcher of the study painting.

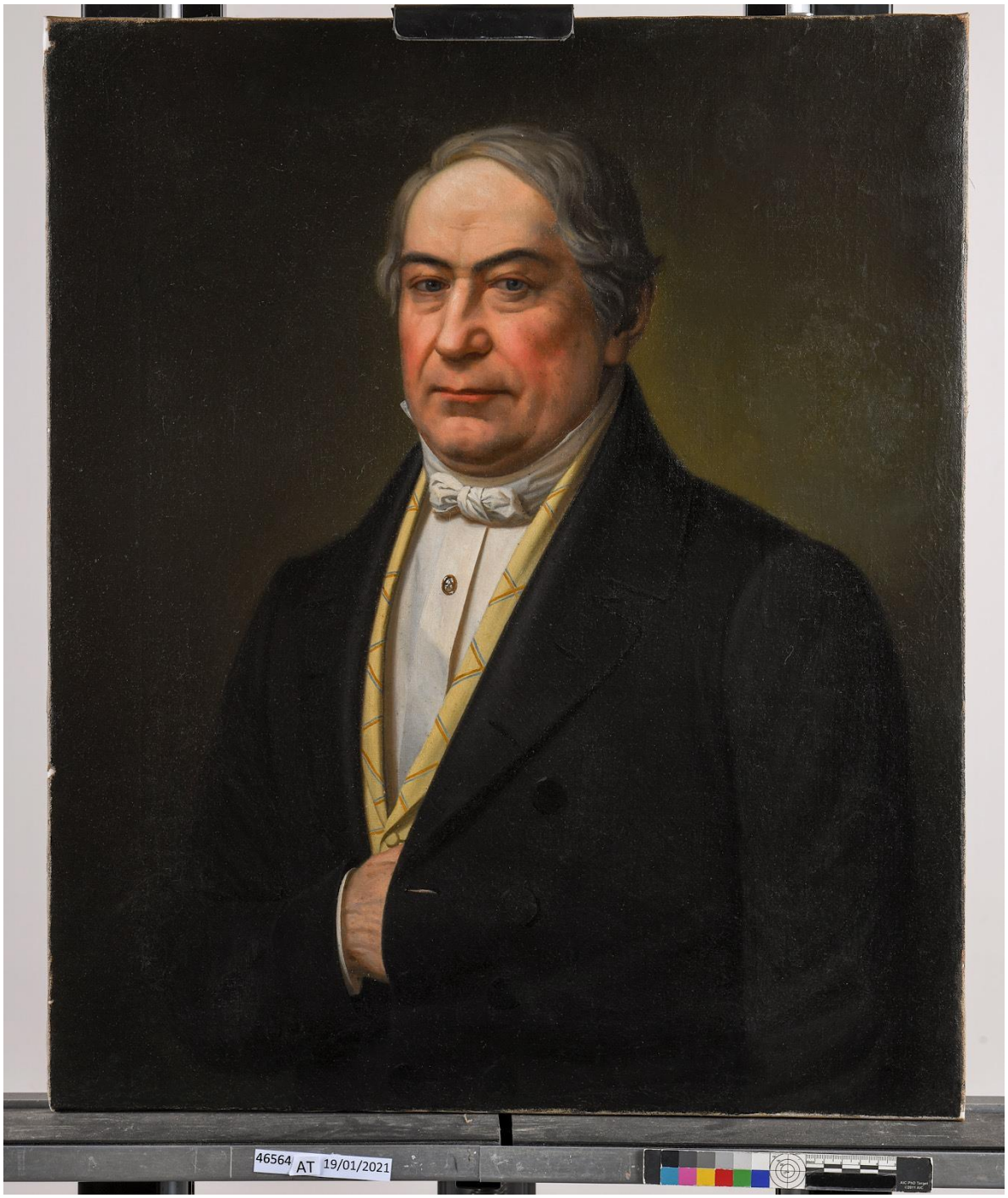

Figure 46. Foreside of the study painting under artificial light after restoration.

Figure 47. Backside of the study painting under artificial light after restoration, including a new hanging wire.

8. PREVENTIVE CONSERVATION

Preventive conservation aims to create optimal structural and environmental conditions that mitigate future damage of art and cultural assets due to external agents[52]. Along those lines, five recommendations are proposed for the study portrait after Martínez[53] and the Canadian Conservation Institute[54] as follows:

(1) Oil-on-canvas paintings are best exhibited at air temperatures from 16 to 25°C [55]. The study portrait should remain in an exhibition room with low air circulation in a safe thermal environment within the human comfort zone. Air relative humidity and temperature should be monitored daily with a hygro-thermometer.

(2) Oil-on-canvas paintings are highly sensitive to pronounced changes in air humidity[56]. Low relative humidity (<35%) contracts the paint layers, which can become increasingly brittle as a result, while high relative humidity (>75%) can cause canvas shrinkage, stretcher expansion and mold growth. The study portrait should be exposed to relative humidity from 40 to 60% across seasons in the exhibition room[5758].

(3) Paint layers are made up of pigments and dyes that can be irreversibly altered by visible, ultraviolet and infrared radiations[59]. The study painting should be exposed to mild light (0 to 150 luxes)[60], and never receive direct sunlight. The installation of an ultra-violet filter on the windows of the exhibition room is recommended.

(4) Sulfur dioxide, hydrogen sulfide, nitrogen dioxide and ozone are air pollutants that can cause chalking, fading and/or discoloration in the paint layers [61]. Additionally, aerosols tend to form a film of dirt over both the paint layers and the stretcher[62]. Those problems could be easily prevented by installing an air filter in the exhibition room, and keeping all room windows and doors closed whenever possible.

(5) The portrait entered the workshop without a frame. Mounting the painting in a wooden frame and a backing board could reduce future environmental and mechanical damage and enhance structural stability.

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[52] LLAMAS PACHECO, R. Op. Cit. p. 103.
[53] GARCÍA FERNÁNDEZ, I. M. (1999). *La conservación preventiva y la exposición de objetos y obras de arte.* Murcia: Editorial KR.
[54] ARNOLD, R. M., H. (2017). *Environmental Guidelines for Paintings – Canadian Conservation Institute (CCI) Notes 10/4*. Canada: Government of Canada, Canadian Conservation Institute.
[55] ARNOLD, R. M., H. *Op. Cit*.
[56] GARCÍA FERNÁNDEZ, I. M. *Op. Cit*. p.74
[57] GARCÍA FERNÁNDEZ, I. M. *Op. Cit*. p.78
[58] ARNOLD, R. M., H. *Op. Cit*.
[59] GARCÍA FERNÁNDEZ, I. M. *Op. Cit*. p. 366
[60] GARCÍA FERNÁNDEZ, I. M. *Op. Cit*. p. 59
[61] ARNOLD, R. M., H. *Op. Cit*.
[62] ARNOLD, R. M., H. *Op. Cit*.

The backing board could be plastic (*Coroplast* or *Hi-Core*) or acrylic (*Plexiglas*), because those materials are light and moderately rigid, and buffer short-term environmental variation such as water diffusion. A foam sheet between the backing board and the canvas could reduce air leakage and create a safe micro-environment[63].

9. CONCLUSION

This study presents the restoration of a 200-year-old portrait undertaken during an internship with an art-restoration company in Australia.

The making of the study painting could be assigned to Jacques Guille, a religious painter and member of the Academy Academy of Sciences, Fine Arts and Letters of Savoy (France).

"Restoration may be a camouflage for forgery in which original remnant material manifestations of the image are reintegrated into an apparently complete and undamaged work, the majority of which may, in fact, be imaginative invention or deliberate deception" [64] . This problem is not uncommon with oil-on-canvas paintings[65], particularly with very old pieces of art[66]. Despite that the paint layers of the study painting were covered by a film of dirt and had been subjected to a previous intervention, the body features of the painted character and the tones and texture of the background remained broadly unaltered. Additionally, the portrait belonged to the neoclassicism and realism movements and so was conceptually simple, while access to other paintings from the same artist were informative with regard to the selection and combination of pigments. Altogether, the latter factors allowed that the applied restoration protocol required no reconstruction of missing information.

The immersion of students in a professional environment during their capacitation is a major asset because it provides hands-on experience in concrete restoration techniques and can fuel their incorporation in a future working environment [67] . This final-year project has clearly fulfilled those

[63] DALY HARTIN, D. (2017). *Backing Boards for Paintings on Canvas – Canadian Conservation Institute (CCI) Notes 10/10*. Canada: Government of Canada, Canadian Conservation Institute.
[64] SCOTT, D. A. (2017). "Art restoration and its contextualization" in *The Journal of Aesthetic Education*, vol. 51, No. 2, pp. 82-104
[65] SOZANNI, L (2010). "Pushing the borders of retouching and reconstruction: can enough ever be too much?" In *Mixing and Matching*. p. 125.
[66] O'RIODAN, C. (2017). "Art conservation: the cost of saving great works of art" in *Emory International Law Review,* vol. 32, pp. 409-432.
[67] PRADO-CAMPOS, B. and ZAMBRANA VEGA, M.D. (2017). "Teaching innovation: the management and development of extracurricular activities in the field of cultural object

expectations and set the path towards further training and specialization that should naturally lead to a career in art restoration.

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11. FIGURE LEGENDS

Figure 1. Foreside of the study painting under artificial light. Credit: Artlab Australia.

Figure 2. Backside of the study painting under artificial light. Credit: Artlab Australia.

Figure 3. French and English versions of the hand writing in a note found on the backside of the study painting. Credit: Celia José Herrando.

Figure 4. Portrait of Chanoine Dolin. Jacques Guille (1848). Oil on canvas, Bramans Church, Saboy (France). Retrieved from: Antonia Coca-De Bartoli, Chambery Fine Arts Museum (pers. Comm., 01/07/2020).

Figure 5. *Monsignor Billiet.* Jacques Guille (1860). Oli on canvas. Fine Arts Museum, Chambery (France). Retrieved from: Antonia Coca-De Bartoli, Chambery Fine Arts Museum (pers. Comm., 01/07/2020).

Figure 6. *Charles Jean-Baptiste Lamproz.* Jacques Guille (1832). Oil on canvas. Bramans Church, Saboy (France). Retrieved from: <https://gallica.bnf.fr/ark:/12148/bpt6k9606690m/f16.item> [Date: 15/10/2020]

Figure 7. *Table XXIII "Arm muscles".* Jacques Guille (1836-1837). Lithography. Albertina Academy Library. Turin. Retrieved from: <https://gallica.bnf.fr/ark:/12148/bpt6k9606690m/f52.item.zoom#> [Date: 15/10/2020]

Figure 8. *Monsignor Billiet.* Jacques Guille (1839). Oil on canvas. 150 × 130 cm. Sacristy Cathedral Saint John the Baptist, Saint-Jean-de-Maurienne (France). Retrieved from: <https://gallica.bnf.fr/ark:/12148/bpt6k9606690m/f56.item.zoom> [Date: 25/10/2019]

Figure 9. *Monsignor Billiet. Jacques Guille* (1845). Oil on canvas. Chambery's Archbishopric, Chambery (France). Retrieved from: <https://gallica.bnf.fr/ark:/12148/bpt6k9606690m/f81.item.zoom> [Date: 25/10/2019]

Figure 10. *Monsignor Billiet.* Jacques Guille (1865). Oil on canvas. 118 × 85 cm. Sacristy Cathedral Saint John the Baptist, Saint-Jean-de-Maurienne (France). Retrieved from: <https://gallica.bnf.fr/ark:/12148/bpt6k9606690m/f104.item.zoom> [Date: 25/10/2019]

Figure 11. *Le Pain de Mai*. Jacques Guille (1871). Oil on canvas. Saint-Pierre of Tartantaise Cathedral, Moutiers (France). Retrieved from: <https://stpierremoutiers.blogspot.com/2018/05/le-pain-de-mai.html> [Date: 25/10/2019]

Figure 12. *The Good Death* (domestic picture)*.* Jacques Guille (1873). Oil on canvas. Saint Joseph in the Church of Fontcouverte, Languedoc-Roussillon (France). Retrieved from: <https://gallica.bnf.fr/ark:/12148/bpt6k9606690m/f122.item.zoom> [Date: 25/10/2019]

Figure 13. Composition diagram distinguishing the foreground from the background of the study painting. Credit: Celia José Herrando.

Figure 14. Light and dark areas of the study painting edited in the *Procreate* software using the "threshold effect". Credit: Celia José Herrando.

Figure 15. Damage diagram caused by the environment in the a) foreside and b) backside of the study painting, created with *Procreate* software. Credit: Celia José Herrando.

Figure 16. Damage diagram caused by an old restoration in the a) foreside and b) backside of the study painting, created with the *Procreate* software. Credit: Celia José Herrando.

Figure 17. Measurements of the old stretcher in centimetres: a) frame length and width, b) bar width, and c) assembly of bars. Credit: Celia José Herrando.

Figure 18. Examples of damages found in the stretcher of the study painting: a) a hole produced by the common furniture beetle *Anobium punctatum*, b) unsound knot and humidity spots, c) modern flat-headed iron nail, and d) metal hook in the upper bar. Credit: Celia José Herrando.

Figure 19. Textile support and plain weave of the study painting using the *Dino-Lite Edge 3.0:* a) thread and b) weave. Credit: Artlab Australia.

Figure 20. Damage in the edges of the canvas of the study painting. Credit: Celia José Herrando.

Figure 21. Backside view of the patches from a previous intervention of the study painting. Credit: Celia José Herrando.

Figure 22. Foreside view of the patches from a previous intervention of the study painting. Credit: Celia José Herrando.

Figure 23. Foreside of the study painting showing a surficial layer of dirt. Credit: Artlab Australia.

Figure 24. Foreside of the study painting under ultraviolet reflectography. Credit: Artlab Australia.

Figure 25. Removing re-painting from an old restoration unveiled the stucco of two patches in the upper-right region of the study painting. Credit: Celia José Herrando.

Figure 26. Sample of flat-head iron nails used to attach the canvas to the bars of the stretcher of the study painting. Credit: Celia José Herrando.

Figure 27. Removal of the upper cardboard layer of the larger patch from an old restoration of the study painting: a) testing the scalpel, b) during the removal process, and c) top layer removed. Credit: Celia José Herrando.

Figure 28. Removal of the lower layer of cardboard of the larger patch from an old restoration of the study painting: a) first area removed, b) half of the area removed and c) completely removed. Credit: Celia José Herrando.

Figure 29. Larger patch from a previous intervention of the study painting: a) before and b) after removing the stretcher (portrait backside). Credit: Celia José Herrando.

Figure 30. Smaller patch from a previous intervention of the study painting (portrait backside). Credit: Celia José Herrando.

Figure 31. Pocket of dirt, dust and wood fragments found between the canvas and the bottom bar of the stretcher of the study painting. Credit: Celia José Herrando.

Figure 32. Canvas backside of the study painting after cleaning. Credit: Celia José Herrando.

Figure 33. Weight bags placed over a glass screen to attenuate canvas bulging of the study painting. Credit: Celia José Herrando.

Figure 34. Canvas of the study painting after flattening on the heat/vacuum table. Credit: Celia José Herrando.

Figure 35. Gluing the fabric inlay to the canvas of the study painting using a brush impregnated with Lascaux Welding Powder. Credit: Celia José Herrando.

Figure 36. Removal of the repainting from the old-restoration patches: a) smaller patch during removal and b) larger patch during removal. Credit: Celia José Herrando.

Figure 37. Portrait foreside after repainting removal. Credit: Celia José Herrando.

Figure 38. Colour and texture of the re-filling material, along with the tip of the scalpel used for re-filling. Credit: Celia José Herrando.

Figure 39. Paint layers of old-restoration patch a) before and b) after re-filling. Credit: Celia José Herrando.

Figure 40. Colour palette showing the pigments used for the reintegration of the study painting. Credit: Celia José Herrando.

Figure 41. Areas containing the old-restoration patches after the reintegration of the paint layers of the study painting. Credit: Celia José Herrando.

Figure 42. Measurements of the new stretcher in centimetres: a) frame length and width, b) bar width, and c) assembly of bars. Credit: Celia José Herrando.

Figure 43. Temporary stretching of the canvas of the study painting using security pins. Credit: Celia José Herrando.

Figure 44. Tapping the wedges with a hammer into the bars of the stretcher of the study painting. Credit: Celia José Herrando.

Figure 45. Stapling the wedges to the stretcher of the study painting. Credit: Celia José Herrando.

Figure 46. Foreside of the study painting under artificial light after restoration. Credit: Artlab Australia.

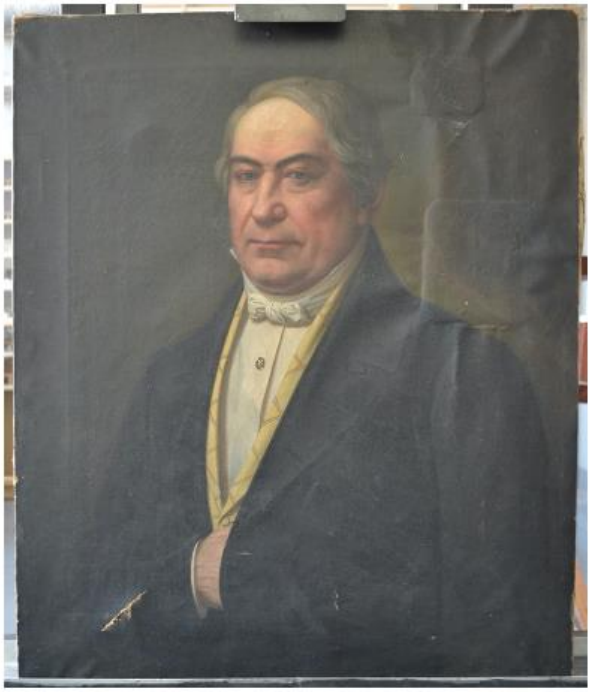
Figure 47. Backside of the study painting under artificial light after restoration, including a new hanging wire. Credit: Artlab Australia.

12. APPENDICES

APPENDIX I: DATA SHEET
(Universidad Politécnica de Valencia)

FICHA TÉCNICA			
AUTOR: Jacques Guille		TEMA: Portrait	
TÍTULO: PORTRAIT OF MAGISTRATE JOSEPH BERNARD FALQUET (1776 – 1836), BY THE FRENCH PAINTER JACQUES GUILLE (1814 – 1873).			
TÉCNICA: Oil			
FIRMA: No signature		FECHA: Begining of 19th Century	
MEDIDAS (en cm):	Altura: 63'5 cm	Anchura: 53,2 cm	Profundidad: 1,5 cm
DATOS DEL PROPIETARIO: Private collection of Artlab´s Paintings and Frames Conservator Rosemary Heysen			
SELLOS E INSCRIPCIONES: Paper label attached on the back of the stretcher			
MARCO: No frame			
ESTADO DE CONSERVACIÓN: Bad			
FECHA DE ENTRADA: 16th June of 2020		FECHA DE SALIDA: 30th October of 2020	
RESTAURADOR: Celia José Herrando			

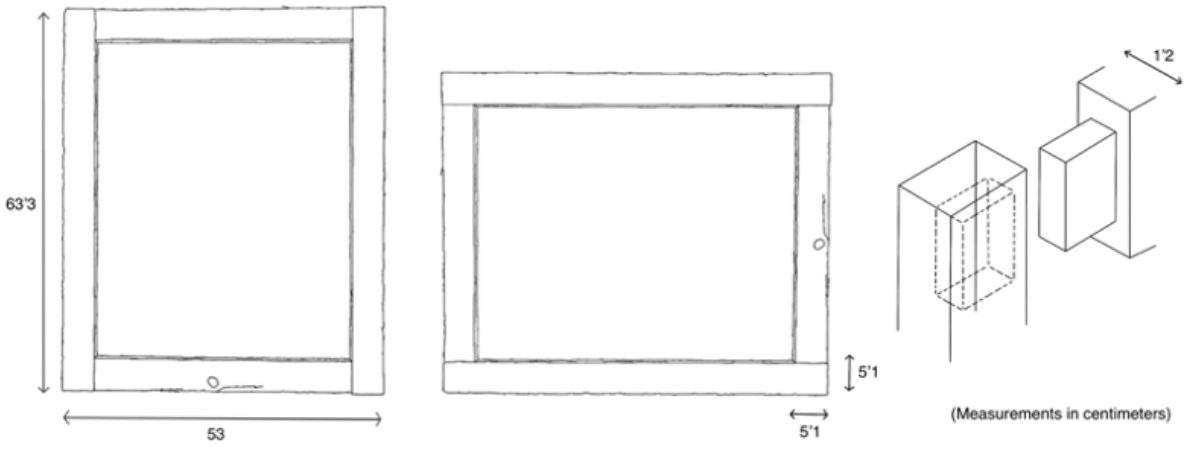
FOTOGRAFÍAS INICIALES

FRONT VIEW	BACK VIEW
	

SOPORTE					
SOPORTE TEXTIL: ASPECTOS TÉCNICOS					
DIMENSIONES TOTALES (en cm): 63, 5 × 53,2					
DIMENSIONES SUPERFICIE PINTADA (en cm): 63, 5 ×53,2					
CLASE DE TEJIDO:	Lino: ■	Algodón: ☐	Cáñamo: ☐		
	Yute: ☐	Seda: ☐	Otros:		
NÚMERO DE HILOS x cm^2: 19 × 17					
COSTURAS: -					
TIPO DE LIGAMENTO: Plain weave					
ORILLO:	Si: ☐	No: ■	¿Dónde?:		
OTROS ELEMENTOS:	Etiquetas: ☐	Papeles pegados: ☐	Inscripciones: ☐		
	Grafismos: ☐	Firmas: ☐	Otros: Two patches		
SOPORTE TEXTIL: ESTADO DE CONSERVACIÓN					
DEFECTOS EN EL PLANO:	Distensiones: ■	Abolsamientos: ■	Otros:		
DESGARROS: ■	AGUJEROS: ■	CORTES: ☐			
BORDES CORTADOS: ■					
ENCOGIMIENTO: ☐					
MUTILACIONES: ☐					
MARCAS EN EL LIENZO:	Causadas por el bastidor: ■	Por enrollado: ☐	Otras marcas:		
ATAQUES BIOLÓGICOS:	Hongos: ☐	Tipo:			
	Insectos : ☐	Tipo:			
HUMEDAD: ■					
OXIDACIÓN: ■					
SUCIEDAD:	Barro: ☐	Cal: ☐	Pintura: ☐	Aceite: ☐	Cera: ☐
	Deyecciones: ■	Polvo: ■	Otros:		
INTERVENCIONES ANTERIORES					
REENTELADO: -	Tipo de material:		Tipo de adhesivo:		
BORDES: -	Tipo de material:		Tipo de adhesivo:		
PARCHES: Yes	Tipo de material: Hard cardboard		Tipo de adhesivo: Animal glue		
INJERTOS:	Tipo de material:		Tipo de adhesivo:		
OTROS: Filler and retouching					

BASTIDOR				
ORIGINAL: ■		MEDIDAS (en cm): 63,3 × 53		
MATERIAL: Coniferous wood		NÚMERO DE ELEMENTOS: 4		
TIPO DE ACABADO:	Lijado: ■	Sin lijar: ☐		
ARISTAS:	Vivas: ■	Biseladas: ☐		
ENSAMBLES:	Móvil: ☐	Fijo: ■		
TIPO DE ENSAMBLAJE: Standard blind mortise and stub tenon				
SISTEMA DE CUÑAS: -		Nº de cuñas: -		
OTROS ELEMENTOS:	Etiquetas: ■	Papeles pegados: ☐	Inscripciones: ☐	
	Grafismos: ☐	Firmas: ☐	Otros: ☐	
DAÑOS:	Ataque de xilófagos: ■	Nudos: ■	Astillamiento: ■	Alabeamiento: ■
INTERVENCIONES ANTERIORES:	Añadidos: ☐	Refuerzos: ☐		

CROQUIS DEL BASTIDOR Y SUS MEDIDAS



CAPAS PICTÓRICAS: ASPECTOS TÉCNICOS

PREPARACIÓN:

TIPO DE PREPARACIÓN:	Tradicional: ■	Comercial: ☐	Imprimación: ☐
COLOR:	Blanca: ☐	Coloreada: ■	
AGLUTINANTE:	Aceite: ☐	Cola: ■	Comercial: ☐
GROSOR (en mm):	Medio: ☐	Fino: ■	Grueso: ☐

PELÍCULA PICTÓRICA:

TÉCNICA:	Óleo: ■	Temple: ☐	Mixta: ☐	Acrílico: ☐	Dorado: ☐
GROSOR DE LA PELÍCULA PICTÓRICA: (en mm)	Gruesa: ☐	Fina: ■	Media: ☐		
TEXTURA:	Empastes: ☐	Fina: ■	Mixta: ☐		
DIBUJO SUBYACENTE: ■					

BARNIZ:

TIPO DE BARNIZ: -

CAPAS PICTÓRICAS: ESTADO DE CONSERVACIÓN

ESTADO DE CONSERVACIÓN:	Bueno: ☐	Regular: ☐	Malo: ■	Muy malo: ☐			
DEFECTO DE TÉCNICA:	Grietas prematuras: ☐	Descohesión: ☐	Piel de naranja: ☐				
ALTERACIÓN QUÍMICA:	Cambio cromático (pigmento): ☐	Transparencia (aglutinante): ☐					
CRAQUELADURAS O GRIETAS:	Envejecimiento: ■	Falsas: ■					
CAZOLETAS:	Si: ☐	No: ■	LAGUNAS:	Si: ■	No: ☐	ABOLSAMIENTOS:	Si: ☐ No: ■
PULVERULENCIA:	Si: ■	No: ☐	EROSIÓN:	Si: ■	No: ☐	OTROS:	
QUEMADOS:	Granulaciones: ☐	Ampollas: ☐	Cráteres: ☐				
HUMEDAD:	Pasmados: ☐	Manchas: ■	Microorganismos: ☐				
ALTERACIÓN DEL BARNIZ:	Intensa: ☐	Media: ☐	Suave: ☐				
	Oxidación: ☐	Amarilleamiento: ☐	Pérdida de transparencia: ☐				
	Pasmado: ☐	Aplicación irregular: ☐	Aspecto:				
SUCIEDAD SUPERFICIAL:	Polvo: ■	Hollín: ☐	Gasa: ☐	Cera: ☐			
	Deyecciones: ■	Barro:	Otros:				

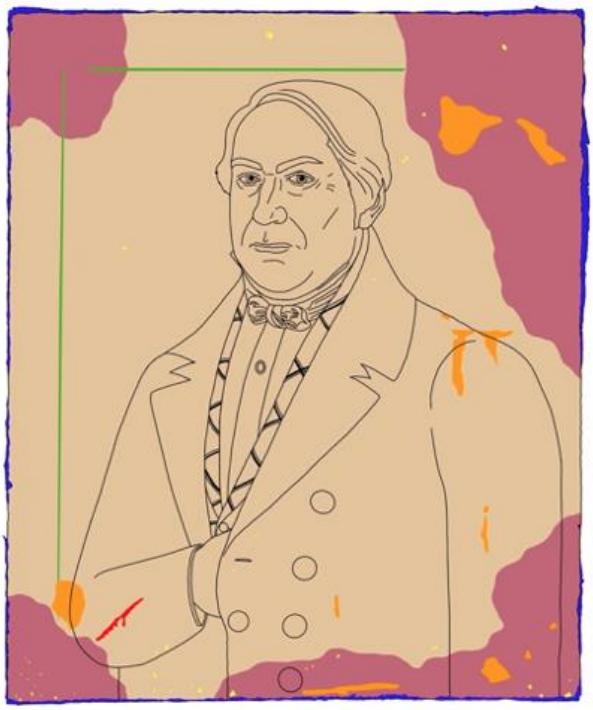
INTERVENCIONES ANTERIORES

PROTECCIÓN: ☐	LIMPIEZA: ■
REPINTES: ■	ESTUCOS: ■
OTROS:	

CROQUIS DE DAÑOS

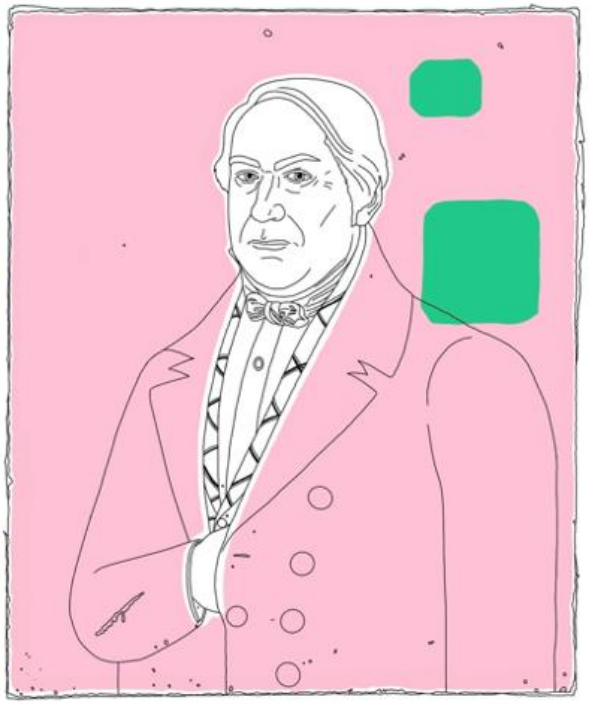
PAINT LAYERS (FRONT VIEW)

A) Without old intervention



Superficial dirt
Textile support bulginess
Paint layer erosion
Paint layers loss
Tear
Marks of the stretcher
Milimetrical holes

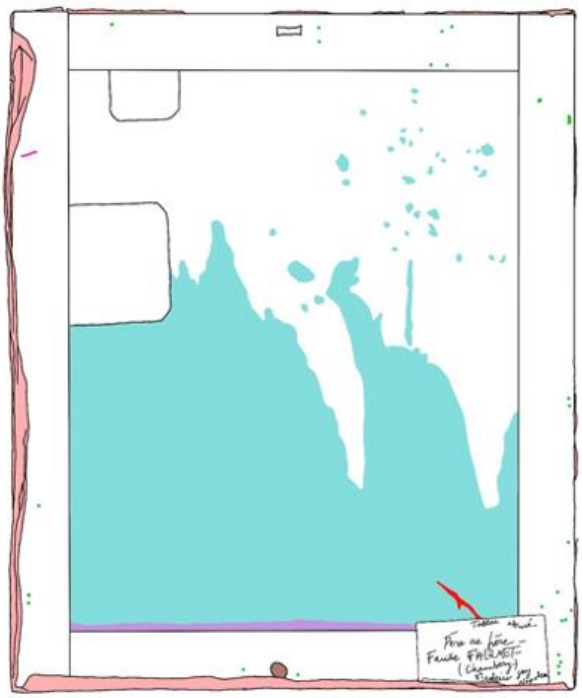
B) Old intervention



Repainting
Bulging in patches areas

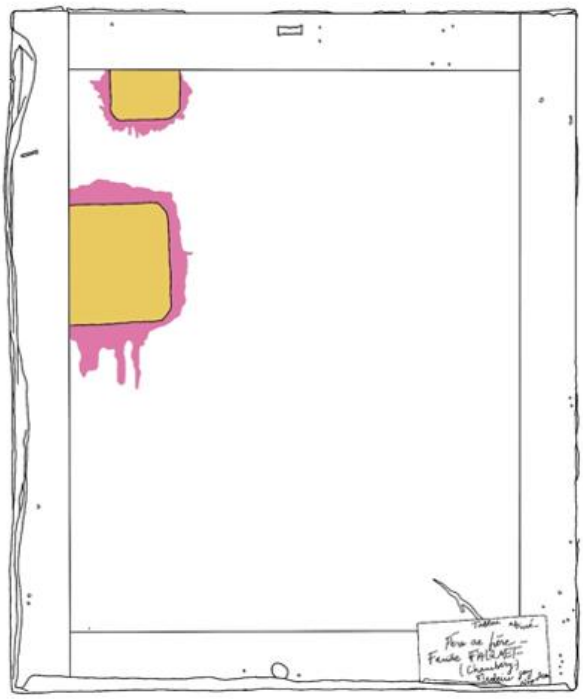
TEXTILE SUPPORT AND STRETCHER (BACK VIEW)

A) Without old intervention

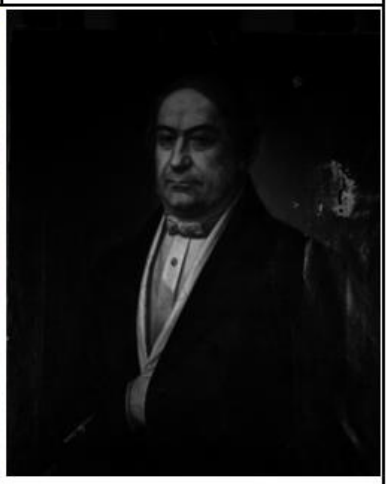


Damaged textile support
Holes by boring insects
Pocket of dirt and dust
Moisture stains
Tear
Knot
Oxidated nail

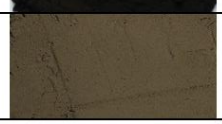
B) Old intervention

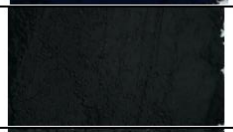


Patches
Patches adhesive spreading

ANÁLISIS REALIZADOS		
	TECHNIC USED	RESULT
VARNISH:	Examination using the ultraviolet light	No varnish layer found
PAINT LAYERS:	Examination using the ultraviolet light	Discovery of a previous intervention (repainting)
TEXTILE SUPPORT:	Inspection of the material using the *Dino-Lite Edge 3.0 Digital Microscope* Thermal behaviour test (burning and twist test)	Cellulose textile support, identify as linen.
PHOTO TECHNICS: • Visible light - General photos - Raking photos - Detailed photos of the Textile support using *Dino-Lite Edge 3.0 Digital Microscope* • UV light • IR light	 ULTRAVIOLET LIGHT	 INFRARED LIGHT

APPENDIX II: LIST OF PIGMENTS USED IN THE REINTEGRATION PROCESS.

C.I. Generic name and Constitution number	Colour	Historical name	Brand	Chemical composition	Type	CAS Number
PW 6 (77891)		Titanium White	Langridge Artist Colours	Pure neutral white, with excellent hiding power; Titanium Dioxide (Rutile); TiO_2	Synthetic Inorganic	13463-67-7
PY 43 (77492)		Golden Ochre	Langridge Artist Colours	Dull Reddish yellow to yellowish orange brown; Native Earth (Italy); Natural Yellow Iron Oxide; Hydrated Iron Oxide; C.I. PY42 100% $Fe_2O_3 \cdot H_2O$	Synthetic Inorganic	64294-91-3
PY 35 (77205)		Cadmium Yellow Deep	Langridge Artist Colours	Bright, light, yellow; Cadmium Zinc Sulphide; CdS, ZnS	Synthetic Inorganic	12656-57-4; 8048-07-5
PR 108 (77202)		Cadmium Red Medium	JNH Art & Conservation Materials	Orange red to deep violet red; Cadmium sulfoselenide; cadmium zinc sulfoselenide (CdS + CdSe)	Synthetic Inorganic	58339-34-7
PR 101 (77491)		Caput Mortuum	Langridge Artist Colours	Synthetic Iron Oxide Red; Synthetic Anhydrous red iron oxide, it may consist of the additional modifiers Cr2 03, FeO, Mn203, or/and NiO in any combination.	Synthetic Inorganic	1309-37-1
PBr 6 (77492)		Burnt Umber Tierra sombra tostada)	JNH Art & Conservation Materials	Brown to dull red; Iron Oxide Hydroxide;	Natural Inorganic	-
PBr 6 (77491, 77492, 77499)		Mars Brown MB 620	JNH Art & Conservation Materials	Brown to dull red; Brown magnetite iron oxide; Prepared Iron Oxide; C.I. Pigment Yellow 42(40-70%), Iron Oxide (Fe_2O_3) (30-60%)	Synthetic Inorganic	51274-00-1; 1309-37-1
NBr 8 (77727)		Van dyke Brown (Tierra de Cassel, Carmelita Van Dyck)	Langridge Artist Colours	Iron hydroxide and manganese oxide (partial components); Fe_2O_3 ($\cdot H_2O$) + $MnO_2 \cdot (n\ H_2O)$ + humid acids; Iron(III)-oxide, partly hydrated + manganese oxide partly hydrated + humid(Myers) acids;	Natural Organic	-
PBr 7 (77491, 77492)		Italian Raw Umber	Langridge Artist Colours	Brown to dull yellow; Native earth (Italy); Brown Iron Oxide; Carbon Black 0-5%, Iron Oxide 50-70%, Limestone 0-10%; Manganese Oxide (MnO_2) 0-15%, Quartz (SiO_2) 0-5%;	Natural Inorganic	1333-86-4, 1309-37-1, 1317-65-3, 1313-13-9, 14808-60-7

C.I. Generic name and Constitution number	Colour	Historical name	Brand	Chemical composition	Type	CAS Number
PBr 7 (77491; 77492)		Raw Umber Green	Langridge Artist Colours	Dull to dark, blueish Green; Iron Oxide Hydroxide; Carbon Black 0-5%, Iron Oxide 50-70%, Limestone 0-10%; Manganese Oxide (MnO_2) 0-15%, Quartz (SiO_2) 0-5%	Natural Inorganic	12713-03-0; 1333-86-4, 1332-37-2, 1317-65-3, 1313-13-9, 14808-60-7
PG 23 (77009)		Antica Green Earth	Rublev Colours	Dull greyish Green; Hydrated Iron Potassium Silicate; $(K, Na)\ (Fe^3, Al, Mg)_2(Si, Al)_4O_{10}(OH)_2$	Natural Inorganic	1344-98-5
PG 23 (77009)		Verona Green Earth	Rublev Colours	Dull to bright, blueish Green; Hydrated Iron Potassium Silicate; $(K, Na)\ (Fe^3, Al, Mg)_2(Si, Al)_4O_{10}(OH)_2$	Natural Inorganic	1344-98-5
PB 28 (77346)		Cobalt Blue	Zenith/Colomont	Pure bright rich blue, with good hiding power; Cobalt Aluminate Blue Spinel; Cobaltous aluminate; $CoO \cdot Al_2O_3$ $CoAl_2O_4$	Synthetic Inorganic	1345-16-0
PB 27 (77510)		Prussian Blue	JNH Art & Conservation Materials	Deep blue, greenish undertone; Ferric Ferrocyanide; $Fe_4[Fe\ (CN)_6]_3$	Synthetic Inorganic	25869-00-5; 14038-43-8
PBk 9 (77267)		Bone Black	Rublev Colours	Dark black; Amorphous Charred-Bone Carbon; Hydroxyapatite (calcium phosphate) and carbon; Ca5(OH)(PO4)3 and C Calcium phosphate + calcium carbonate +carbon; $Ca_3(PO_4)_2 + CaCO_3 + C$	Synthetic Inorganic	8021-99-6
PBk 6 (77266)		Lamp Black (Negro de humo)	Langridge Artist Colours	Nearly pure amorphous carbon; Very stable pigment; Dark blueish black; Amorphous Carbon, Carbon (Acetylene); Type of carbon black obtained from the soot of burned fat, oil, tar, or resin; C	Synthetic Inorganic	1333-86-4