

Colour Matters: Exploring Colour and Chromatic Materialities in the Long Nineteenth Century (1798-1914)

Author's Biographies and Abstracts

- **Yazmín Villaseñor Aguayo** is currently part of the master's degree in art history at the Autonomous University of Mexico (UNAM) with a specialty in the study of techniques and materials in art, where she participated in the summer school of *Inventing, analyzing and restoring color: art history and heritage science* as part of the partnership between Sorbonne Université and UNAM. She is interested in microscopy and has attended to SEM's courses and workshops. Her most recent research is a multidisciplinary project for the study of color by the Mexican painter José María Velasco. His training was in art studies and history at the Universidad del Claustro de Sor Juana where she focused on 19th and 20th century art.

Constructing Color in two paintings of the Geological Eras by José Maria Velasco at the Geology Museum, UNAM

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José María Velasco, was one of the most recognized Mexican artists of the 19th century. In 1904 Velasco was tasked with making ten paintings that would decorate the main hall of the new building of the National Geological Academy. These paintings are referred to, as the culmination of Velasco's artistic and scientific activity presenting together the scientific, the landscape and the still life.

We address the relevance of Velasco's methods of selection of color materials and his application of color to create a painting with a scientific and aesthetic value as a specific moment for his last productions Selection of two paintings: *Flora y fauna del period cretácico* y *Flora y fauna del period pleistoceno* was made due to its special characteristics, the first one is a reinterpretation of a painting made by Josef Hoffmann from Vienna's Natural History Museum, which Velasco only saw on a black and white postcard, so he had to interpret and study the colors necessary for a paleoscape and the second painting is an original composition inspired by illustrations from American science magazines.

Velasco's brushstrokes technique was studied through imaging and microscopic surface analysis, the materials composition identified with XRF and FORS spectroscopies, while

colorimetry was used to relate the color space of the materials with the visual color palette appreciated. His technique was very characteristic of a landscape school originated at the San Carlos Academy, where he taught landscaping and perspective classes.

This is the first interdisciplinary analysis performed by art historians with heritage scientists to shed new light to these paintings, considering color as a representative element of them and generate in-depth insight into the artwork in terms of original intention, choice of materials, and painting techniques giving particular attention to aspects related to aesthetics and composition as one of the main characteristics solicited to the artist at the time.

- **Anaïs Alchus** studied at the École du Louvre, Nanterre university and the Institut national du Patrimoine. After four years as a curator in the musée national Adrien Dubouché in Limoges, she was appointed curator for 19th-century decorative arts in the musée d'Orsay in 2020. Her research projects deal with revivals in 19th-century decorative arts, display and museums' history, as well as art restoration history.
- **Fiona Anderson** is a Lecturer in Design History and Theory at Glasgow School of Art. She was formerly Senior Curator of Fashion and Textiles at National Museums Scotland. Fiona has previously held lecturing posts in the history and theory of fashion, textiles and design at Edinburgh College of Art, Central Saint Martins and the Royal College of Art. Her published research includes the book, *Tweed* for Bloomsbury Academic (2017). Fiona's publications on colour in textile design include the essay 'Bernat Klein: Colouring the Interior' in *British Design: Tradition and Modernity after 1948*, ed. by Christopher Breward, Fiona Fisher and Ghislaine Wood (2015).

Masculinities, Colour, Landscape and the Design of Tweeds

Colour has been a key element within the design of tweeds from the 1830s up until today.

This paper focuses on new interdisciplinary and material culture research about early tweed design, which shows that novel ways of using colour in woollen textile design evolved from the 1830s in Scotland. In that period, many of what became the key visual characteristics of the 'family' of textiles known as tweeds developed. The historical and international significance of these colour and design developments is shown by the continued popularity of tweeds within men's and women's fashion since the mid-nineteenth century. The paper explores the influence of Romanticism, landscape, sport, fashion and gender on the

development of the newly colourful Scottish woollen designs, which by the 1830s had become known as tweeds. It also investigates how fashionable London male consumers, Edinburgh and London merchants and Scottish woollen manufacturers had a significant impact on the design evolution of these cloths. The scant published research on Euro-American men's fashion textiles of the nineteenth century has primarily focused on English broadcloths in black, or other dark colours. Investigating the use of colour in early tweed design therefore provides significant new perspectives about the social and cultural meanings of menswear woollens within the late Romantic era and beyond.

- **Lora Angelova** is a Scientific Associate at the Rathgen Laboratory in Berlin, where she supports the coordination of the EC Project ARCHE - Alliance for Research on Cultural Heritage in Europe. She was formerly Head of Conservation Research at The National Archives, UK and a Conservation Science Researcher at Tate. As a material chemist, she has worked primarily on developing conservation treatment methods for traditional and contemporary artworks. Her current research is focused on a critical examination of the role of heritage science in contemporary conservation practice, and recasting notions of care, access, and value of material records and archives.
- **Tobah Aukland-Peck** is a PhD candidate in Art History at the Graduate Center of the City University of New York. Her dissertation, *Mineral Landscapes: British Art and Extraction, 1937-1975* argues that resource extraction, and its attendant issues of pollution, materiality, and labor, provided a rich subject matter for mid-century British artists, who were interested in integrating the nation's changing landscapes and workplaces into an increasingly abstract practice. Her work has been supported by the Paul Mellon Centre for British Art, Historians of British Art, and the Art + Science Connect initiative at the CUNY Graduate Center. She has essays on topics related to British landscapes and environment published by Courtauld Books Online and forthcoming in Grey Room.

Turner's Pencil: Watercolor, Graphite, and the Lake District's Industrial Landscape

In JMW Turner's 1797 drawing *Glaramara from Borrowdale*, a line of grey-brown mountains rendered in delicate watercolor appears in the center of the sketch like a mirage. The detailed color rendering starkly contrasts with the simple graphite outlines around it, which collapse

form and color into a homogenous expanse of grey lines and white paper. Turner drew *Glaramara from Borrowdale* during a sketching tour of England's Lake District, and scholars have since debated whether the watercolor was a product of experience or memory. Were the painted areas added en plein air? Back in Turner's local lodgings? Or months later in his London studio? This paper takes up the contrast between graphite and watercolor in Turner's Lake District drawings to explore the interaction between materiality—the local industrial provenance of the graphite—and representation—the later addition of the watercolor. When Turner drew *Glaramara from Borrowdale*, he was just a few miles from the famous Borrowdale Graphite mine. This mine, Europe's principal source of graphite from the sixteenth through nineteenth centuries, was synonymous with the pencil. In turn, the portability and simplicity of the pencil helped popularize the sketching tour, predicating Turner's presence in the Lake District on the mineral composition of its topography. Turner used graphite both visually and conceptually, to represent texture, make notes about color or subject, and silhouette form. While the graphite mark was an artistic act, it also readied the images as data for a later watercolor or oil painting. When he added watercolor to the graphite substrate, it was an act of both observation, based on the sketch, and of imagination, based on his memory. The monochrome graphite sketch, created in close proximity to the site of its extraction, challenges the mimetic precedence of color, suggesting a mode of representation that is both an artifact of the physical landscape and evidence of the artist's experience of it.

- **Nathalie Balcar**, conservation scientist, 20th Century and Contemporary Art section, Conservation Department, Centre de recherche et de restauration des musées de France (C2RMF). Since 2008, Nathalie Balcar has been contributing to the preliminary studies and scientific monitoring of work on modern and contemporary works entrusted to the C2RMF. She has specialised in the study and analysis of synthetic materials and has built up and maintained databases on these materials (plastics, artists' paints and industrial paints) by collecting, studying and conserving reference samples. She is involved in study and conservation research programmes on contemporary materials, contributing to their definition, implementation, completion and development.

Tracing the original colors of the toilet of the duchess of Parma

The toilet of the duchess of Parma is one of the masterpieces of 19th-century goldsmith, but it is also one of the best examples to study the polychromy which was much appreciated in goldsmith at that time. Silver, gilded silver, oxidised iron, blue and red translucent enamels,

grisaille painted enamels, precious stones, all contributed to create vibrations and contrasts which have faded and partially disappeared over time.

The undergoing restoration revealed that the material which we thought to be translucent enamel was instead colored resin (maybe fossilized resin) which was meant to imitate enamel. This material had been partly removed during previous restorations, and what was left was in a very bad condition, opaque and blackened. This is why we decided to try and find if we could identify what the original « blue » and « green » colors of this false-enamel were.

In this paper, we will show how we articulated the skills of the three different professions involved (restorer, conservation scientist and art historian) to make examination, scientific data and textual sources help one another making sense. We will also show how comparisons with other pieces of the time helped us better circumscribe the subject and determine the best options for the restoration.

- **Marco Benvenuti** is Associate Professor at the Earth Sciences Department and President of the Museum System of the University of Florence. His main research interests include the applications of mineralogy to the study of ore deposits and archaeometallurgical processes and the enhancement and conservation of the Environmental and Cultural Heritage. He authored about 300 scientific contributions, including 120 papers in national and international journals and chapters of books and 180 communications to national and international conferences. He has been Invited Speaker in national and international conferences. He gives several courses of Applied Mineralogy at the University of Florence and is member of the following national and international scientific societies: Society of Economic Geologists (SEG); Historical Metallurgy Society (HMS); the European Association for the Conservation of the Geological Heritage (ProGEO); Italian Association of Archaeometry (AIAr); Italian Association of Metallurgy; Italian Society of Mineralogy and Petrology (SIMP); Italian Geological Society (SGI); Italian Society of Environmental Geology (SIGEA); Italian Society of Neutron Spectroscopy.
- **Helene Engnes Birkeli** is an Associate Lecturer in History of Art at the University of St Andrews. She completed her PhD at University College London in the summer of 2022 with her thesis titled ‘Tracing Territory: The Visual Culture of Danish(-Norwegian) Colonialism in the Caribbean.’ Her publications include contributions to *A Comparative*

Literary History of Modern Slavery, the Danish art history journal *Periskop* and the UCL graduate journal *Object*. She is currently preparing her thesis into a monograph proposal. Her next research project investigates blue-and-white porcelain in Denmark-Norway in the long nineteenth century (1775-1900).

Cobalt blue in Denmark-Norway: Porcelain, Extraction and Risk

Following the 1772 discovery of cobalt ore in Modum, Norway, *Den Kongelige Porcelainsfabrik (Royal Copenhagen)* had secured Denmark-Norway with a supply of precious raw colour matter for blue-and-white porcelain. With the Treaty of Kiel, 1814 marked the end of the conglomerate state. The new finance minister in devolved Norway, Count Wedel Jarlsberg, had collected a large hoard of cobalt and arsenic at Modum, and hoped to use this to contribute to the nation's ailing economy. However, *Blaafarveværket [The Blue Colour Works]* itself had been pawned to the Swedish industrialist Peter Wilhelm Berg, who refused to comply with the state transfer of the works and its mined cobalt deposits. In 1820, the works were finally sold at auction, following which its 'golden age' reportedly produced eighty percent of the global demand for cobalt.

Drawing on research for my postdoctoral project on blue-and-white porcelain in Denmark-Norway in the long nineteenth century (1775-1900), this paper explores the role of cobalt blue in the intersection of visual culture and extractive industrial history. I am particularly interested in the methodological possibilities of cobalt blue's chain of geological sourcing, chemical separation from arsenic and following pigment refinement. In this paper, I thus seek to shed light on two under-explored fields in colour history; European cobalt in the long nineteenth century and the political/financial agency of colour matter in periods of nation- state instability. Parallel to cobalt's immediate political purchase were emerging geological narratives of Norway such as H.C.F. Schumacher's *Versuch eines Verzeichnisses der in den Dänisch-Nordischen Staaten sich findenden einfachen Mineralien...* (1801). It is my hypothesis that its geological source affixes 'deep time' dimensions to blue porcelain pieces that run contrary to what is seen as an increasingly accelerated speed of globalised trade and financial risk.

- **Amélie Bonney's** research lies at the intersection of environmental history, history of science and technology, and history of medicine. Her doctoral dissertation (Centre for the History of Science, Medicine and Technology of the University of Oxford) focuses on the construction of expert knowledge on toxic colours and the management of industrial hazards in France and Britain between 1830 and 1914. It compares responses

to the industrial hazards of colour production and use in both countries and shows how issues of occupational health and environmental pollution became a means for medical men and scientists to strengthen their reputation and assert their expertise. It further highlights how theories of waste management and technological innovation were used to legitimize the creation of hazardous industries throughout the nineteenth century and beyond. Amelie is currently part of the Science Department of Paris Saclay University and also teaches undergraduate history courses at Sciences Po. You can learn more about Amelie's work on [Academia.edu](#) and [Twitter](#), or contact her via [email](#).

From dye to explosive: assessing the risks tied to picric acid production in industrialized France and Britain, 1850-1914

Throughout the nineteenth century, the yellow dye picric acid was both a source of awe and of fear. Discovered by Irish chemist Peter Woulfe in 1771, this substance was found to be remarkable for its dyeing qualities, and produced a large palette of different hues. However, the golden picric acid crystals also had dangerous properties. They exploded like gunpowder, and were said to produce the same effect than a handgun. In 1866, a French decree on the classification of polluting and insalubrious industries therefore changed the status of picric acid, deeming it to be a part of the first and most dangerous category of insalubrious industries or part of the third category depending on the production method used. In England, no specific legislation existed to regulate the production of picric acid and numerous accidents occurred before the substance was legally recognized as an explosive. In both cases, picric acid production sparked numerous debates tied to the categorization of this substance, and to the rapidly evolving understanding of its properties.

This paper examines how knowledge on the properties of picric acid was constructed, leading to a recategorization of the substance. It shows that numerous groups of historical actors were involved in this process. It is notable that due to the effects of accidents on workers and on the natural environment, public protest occurred in several industrial centers in which the dye was produced. In Lyon in France as well as Huddersfield and Lancaster in Britain, part of the local population was concerned that the fumes emitted by the industry would affect the local vegetation and their health, forcing them to migrate to other locations. On the other side of the spectrum, government authorities consulted scientific experts to assess the risks of picric acid production, yet these experts often asserted their faith in technological progress and science as a means to minimize the hazards of industrial pollution. On another level still, picric acid was widely discussed in medical literature by the turn of the twentieth century, and praised for its

curative properties. This paper thus brings to light some of the processes through which the hazards tied to picric acid production and use were rationalized, leading to further accidents long after the dangerous properties of the substance were known.

- **Linda Borsch** is responsible for the technical examination and treatment of medieval metalwork, European bronzes, and American metal and stone sculpture. Linda holds a master's degree in art conservation from Queen's University, Canada, and completed internships in medieval art at The Met, in the furniture lab at the Canadian Conservation Institute in Ottawa, and in the archaeological and decorative metals lab at the Hermitage Museum in Saint Petersburg. Linda was awarded a two-year fellowship at The Met, during which she focused on medieval art. She worked for ten years on the reinstallation of the Greek and Roman collection before assuming her current responsibilities for European and American art in 2001, which expanded to include medieval art in 2016.
- **Nathalie Boulouch** is an associate professor at Rennes 2 University. She teaches history of contemporary art and history of photography. Since completing her PhD on Autochrome photography in France (1903-1931), her main research has focussed on the history of color photography (19th-20th centuries) from a technical, cultural, artistic and critical point of view. She has curated exhibitions and has written numerous essays on the subject. Her most sizeable publication to date is the book: *Le Ciel est bleu* (2011). In 2020, she organised a symposium entitled "What Does Colour Do to Photography?" held in the Cerisy international center (France) and she is now editing the linked publication. Part of her research centres on the history of the projected photographic image from the 19th century until the end of the 20th century. In 2017, she was associate curator for the exhibition: *Slides. The History of Projected Photography* (Musée de l'Elysée, Lausanne). She is currently working on a project launched by Photo Elysée (Lausanne) about interferential colour photography invented by Gabriel Lippmann. She is associate curator for the exhibition *Gabriel Lippmann. La photographie des couleurs* (Photo Elysée, Lausanne, 3 mars-21 mai 2023). She is also associate curator for the exhibition *Les couleurs de la mode. Le Salon du goût français (1921-1923)*, that will open at mid June 2023 at the musée de la mode de la ville de Paris, Palais Galliera.

Wavelengths and potato starch: (im)materialy in colour photography

Observed as a lack at the time of the invention of photography, color is one of the major subjects of progress to be made throughout the nineteenth century. My paper proposes to focus on the period between 1891 and 1907: that is, between the invention of the interferential process of color photography by the French physicist Gabriel Lippmann and that of autochrome by the industrialists Auguste and Louis Lumière. This turn of the century is also a turning point for the history of color photography.

On 1891, Gabriel Lippmann invented a process of colour photography based on the recording of wavelengths. As the President of the Royal Academy of Sweden described it in 1908: "The color effect in Lippmann's prints does not come from [...] pigment colors: we are dealing here with what are called virtual colors." Indeed, the colors in the interferential process have no materiality. They are comparable to those that appear on soap bubbles.

In 1907, a new revolutionary process, the autochrome, is put on the market by the Lumière brothers. Its singularity lays on the use of potato starch grains dyed with aniline dyes in red, green or blue. Between these two processes the way of recording colour in photography is completely different. While the French physicist sought to capture a colour image directly, the autochrome drew attention to the reproduction of colour by additive synthesis.

If the modes of recording colors differ, the photographs obtained will find in the use of a common means of visualization. Projection, which produces an immaterial, temporalized and spectacular image for a collective sharing of images, is indeed at the heart of the diffusion of color photography. Three-dimensional objects asserting their materiality, interferential photographs and autochromes only exist as images through the effect of the light of the projector, which gives them their dimension of a luminous "painting".

It is this tension between materiality and immateriality in the history of the first color photographs that will be discussed in my paper.

- **Lucia Burgio** is Lead Conservation Scientist at the Victoria and Albert Museum, London. She graduated in Chemistry summa cum laude from the University of Palermo, Italy, and completed a PhD degree in Chemistry at University College London. She manages the V&A scientific laboratory and guides the scientific analysis and technical examination of museum objects. Her primary interests include traditional pigments, artists' materials, and Asian and American lacquer. She assists the Museum's curators and conservators in the examination and understanding of the objects, providing information on materials and techniques, manufacture, history and possible dating. She provides guidance and expertise in the development of scientific research at the V&A

and other institutions. She is a Fellow of the Royal Society of Chemistry; has been an Honorary Research Fellow at the Department of Chemistry, University College London, since 2001; has been chairing the AMC Heritage Science Expert Working Group, Royal Society of Chemistry, since 2014, using her position to promote the role and importance of analytical science in the cultural heritage sector and disseminate heritage science to various audiences.

- A former ENS Fellow at Columbia University in the City of New York, **Joy Cadot** is a forthcoming PhD student at Paris I Pantheon-Sorbonne University. She graduated from Paris I Pantheon-Sorbonne University (MA in Art History) and from the Ecole normale supérieure (ENS Ulm) with a major in Art History and a minor in Ancient studies. At Sciences Po Paris, she also studied history and economics within the scope of her MA in Public Affairs. Supervised by Prof. Charlotte Ribeyrol (Sorbonne University) and Prof. Pierre Wat (Paris I Pantheon-Sorbonne University), her PhD dissertation will explore the imaginary and shifting values of marble, as both a material and as a pictorial motif, from the Great Exhibition at the Crystal Palace to the beginning of the 20th century. As part of her academic curriculum, she took part in several workshops and colloquia, and has already worked as a Research Assistant for curators and scholars, both in France and abroad. Her research centers on British and French Art with a specific focus on material culture studies and intermediality. As a result of her Master's thesis, she is about to publish an exhaustive monograph devoted to Lawrence Alma-Tadema entitled *Lawrence Alma-Tadema. Un peintre dionysiaque au pays des Victoriens* (Paris: Cohen & Cohen ed., 2024).

(Re)creating marble with colours. A material and technological approach of George Frederic Watts' work.

Like his French counterpart Jean-Léon Gérôme, George Frederic Watts, who worked both as a painter and a sculptor, provides a stimulating case study for thinking about the so-called *paragone* question, namely the artistic rivalry between different art forms, especially since this debate revived in the late nineteenth century. His painting, *The Wife of Pygmalion. A Translation from the Greek*, particularly testifies to his interest in the relationships between various media. Indeed, as underlined by Elizabeth Prettejohn, its “title might refer simply to the *translation* of a notionally Greek legend into an English picture,” but “the word *translation*

[also] cleverly captures the process of recreating the forms of the sculpture in a modern painting.”

In this communication, I would like to further explore the idea of *translation*, from stone to colouring pigments, by focusing on a technological approach of Watts’ work and practice. As shown by Lene Østermark-Johansen, “the concern with light effects and surface structure,” which appears in Walter Pater’s depictions of ancient Greek *bas-reliefs*, also finds equivalents in painting at that time. Similarly, I would like here to show how Watts *materially* translates elements of sculpture into his paintings. As mentioned by his wife Mary S. Watts, the artist paid great attention to the material aspects of his works: in addition to his “inclination for matt surfaces and crisp dry touches” and the “impasto quality,” which was quite the opposite of the *academic fini* praised by the Royal Academy, colours played a key role in his process of translation. He himself declared that “in the best sculpture you feel the palpitations of colour.” Focusing on the technical aspects of Watts’ paintings will contribute to enriching this notion on *translation* and to show how colour was considered by the artist as a material as substantial as stone.

- **Federico Carò** received his PhD in Earth Science from the University of Pavia, Italy, where he worked on the characterization of natural and artificial building materials. At The Met, he investigates inorganic materials and techniques employed in artistic production, in close collaboration with conservators and curators. Particularly, his research interests focus on the mineralogical, petrographic, and geochemical characterization of stone and other geological materials in provenance and conservation studies.
- **Suchitra Choudhury** is an independent scholar who specialises in English literature associated with India. Her monograph *Textile Orientalisms: Cashmere and Paisley Shawls in British Literature and Culture* is recently published with Ohio University Press (2023). She has been a contributing advisor to V&A Dundee’s project of decolonising objects.

“A trunk full of ... white shawls and red shawls”: Fashionable Colours and the British Empire in Nineteenth–Century Literature

This paper will explore the way in which representations of colour in nineteenth-century cultural texts can reveal anxieties about gender and empire. A vast number of Cashmere shawls from the Indian subcontinent were imported into Britain as fashionable accessories. These were particularly popular with wealthy women; the less wealthy, however, were happy to wear their cheaper imitations, which widely came to be known as ‘Paisley’ shawls.

Several writers portray and discuss oriental shawls in their imaginative writing. An examination of this discourse shows that not all colours were popular – or even represented; rather, white and red shawls formed staple favourites. Broadly speaking, whereas white was seen as being a feminine and tasteful colour, the configuration of a ‘red shawl’ sometimes brought into view a disruptive context of rebellion and insurrection. The use of colour by fictional writers, no doubt, would have been informed by popular knowledge about new inventions in colour technologies; yet at the same time, it also seems to have matured in response to contemporaneous developments in the domestic arena of women’s empowerment as well as the British empire in India, especially around the 1860s. The abstract economy of the colour topography in Wilkie Collins’ popular novel *Armadale* (1864–66), for example, shows how the use of a red accessory actually coincided with anxieties relating to feminine infringement and colonial transgression. As such, going beyond a cursory association with fashion and clothing, one finds that colour sometimes functioned as a vehicle to transport a sense of nervousness in the face of an emerging modernity and nation building. Using literature and printed discourse, and employing the case study of the fashion of oriental shawls in Britain, the paper hopes to introduce a literary– postcolonial aspect to current scholarship in colour.

- **Dionysia Christoforou** is paper conservator at the Rijksmuseum since 2008. She studied Archaeology and Art History in Greece prior to completing her Masters in conservation of works of art on paper in Northumbria University, England. Before coming to the Netherlands, she worked as a project paper conservator for the Walter Crane Archive at the Whitworth Art Gallery, University of Manchester.
- **Pauline Claisse** holds a Master's in Archaeometry from the University of Bordeaux Montaigne and a Master's in Analytical Chemistry from Sorbonne University. She is currently a CNRS doctoral student in the Physics of Archaeomaterials at the University of Bordeaux Montaigne, at the Archéosciences Bordeaux laboratory, under the co-direction of Rémy Chapoulie (Professor at the University of Bordeaux Montaigne),

Aurélie Mounier (CNRS research engineer at Archéosciences Bordeaux) and Mohamed Dallel (researcher engineer at the Laboratoire de Recherche des Monuments Historiques). Her thesis subject is the non-contact analysis of the materials of the hanging of the Lady and the Unicorn (15th century), preserved in the Musée de Cluny. The original natural dyes and those used for successive restorations are studied in this thesis. Particular attention is paid to the heavily altered areas to understand the degradation phenomena.

Restoration of a tapestry at the end of the 19th century: use of natural or synthetic dyes? Case of the Lady and the Unicorn hanging (15 th c., Musée de Cluny)

Authors : Claisse Pauline, Marembert Charlotte, Sarda Marie-Anne, Chapoulie Rémy, Dallel Mohamed, Mounier Aurélie

The Lady and the Unicorn tapestry, made at the end of the 15th century, was acquired by the Musée de Cluny in 1882. The set consists of 6 tapestries representing an allegory of the five senses. Since their discovery, they have undergone more than a dozen restoration campaigns. During the 1889 restoration carried out by Jules André Lavaux, a tapestry weaver who worked both for the Gobelins manufactory and as an independent weaver, a horizontal band at the bottom of the tapestries, was entirely rewoven and is now considerably deteriorated and discoloured.

The identification of the dyes used for this restoration using non-contact methods (optical microscope, hyperspectral imaging – VIS&SWIR – and fluorimetry) provides a better understanding of the history of the Lady and the Unicorn hanging, as well as that of the Manufacture des Gobelins, whose dyeing workshop was going through a complex economic and production context at the time.

The identification is facilitated by the creation of a colour chart respecting the recipes described in the archives and manuscripts of the 19th century. The chart was undertaken thanks to the collaboration with the Myrobolan workshop (Brussels). More than 80 samples were created with synthetic dyes on wool and silk to record the spectra with our non-contact methods to constitute a specific reference database.

According to this database and research into historical sources, it is shown, against all expectations, that natural dyes were used during the 1889 restoration. This discovery allows us to re-examine the dyeing and weaving techniques used at the Gobelins at the end of the 19th century. It raises new questions about the lightfastness of the natural dyes produced at that time.

- **Alison Matthews David** (she/her) is Professor in the School of Fashion, Toronto Metropolitan University. She has a PhD in Art History from Stanford University and has published extensively on historical dress and material culture. She has a longstanding interest in the history of colour, dyes and fashion in the long nineteenth century and is now a practicing natural dyer. She is co-founding editor of the open access journal *Fashion Studies*. Her 2015 book *Fashion Victims*, looked at how clothing physically harmed the health of its makers and wearers. Her current book and exhibition project, *The Fabric of Crime: Forensic Histories of Fashion*, investigates the theme of crime and clothing as weapon, evidence, and disguise.

Bright Coal and Sad Iron: Mining the Colour Field

Historically and in many cultures, colour was a key marker of fashion and status. Clothing made from natural fibres, leather shoes and other dress accessories—combining metal, wood and ivory—formed complex material amalgams with the dyes, prints and patterns that imbued and adorned them. While we might be aware of the natural origins and harmful practices involved in the production of raw materials like cotton picked by enslaved workers or leather from a range of animal sources, we tend to think less about how extractive mining practices were at the heart of many of the brilliant hues that tinted historical wardrobes in the nineteenth century. Miners toiled underground, staining their own clothes and bodies to unearth the iron and coal that produced impeccable black suits and bright silk gowns.

Mining had long supplied dye artisans and then chemists with the elemental metals they required in their trade. As mordants and modifiers of colour, alum brightened and enhanced hues, while iron deepened and “saddened” them. All of these substances made dyes more colourfast, and most continued in use with the advent of aniline colours. This paper maps out how extractive mining techniques and technologies accelerated globally, thus deleteriously influencing dying practice and causing ecological damage. Professional dyers harnessed substances like iron, copper, tin, alum, and of course coal in their vats to produce a sometimes harmful rainbow of colours. Mining shifted the landscapes of colour and fashion in both literal and figurative ways.

- **Joyce Dixon** recently completed her PhD at Edinburgh College of Art, based in History of Art and funded by the Arts and Humanities Research Council. Her research extends across art, science and book history, and examines the social and cultural history of

Edinburgh in the early nineteenth century, through the lens of *Werner's Nomenclature of Colours* – a colour manual compiled in 1814 by the artist Patrick Syme. She also has a Master's degree from the Royal College of Art, and have presented my research at the Linnean Society of London, the Scottish National Gallery and various other venues.

Annotating Syme: Marginalia in *Werner's Nomenclature of Colours* (1814/1821)

In the spring and summer of 1814, one hundred copies of a new colour publication entered the marketplace, printed and published in Edinburgh. Each was enclosed in tan paper boards, with a printed label affixed to the cover that read “Werner’s Nomenclature of Colours, Adapted to Zoology, Botany, Chemistry, Mineralogy, Anatomy, and the Arts, By P. Syme.” The focal feature of the book’s interior was a series of colour charts, containing the textual and material iterations of 108 different hues, matched to objects from the natural world.

A second edition appeared in 1821, bringing the total copies of Patrick Syme’s pocket-sized colour manual to two hundred. Those that survive are the subject of this paper, which considers the individual object-histories of its multiple “book-copies”, by way of provenance information and the physical remnants left by its readers. These appear as marks and marginalia, signatures, dedications and bookplates, as well as material additions in the form of painted swatches, feathers and squashed flies.

The result of a global survey of more than eighty individual copies, this paper uncovers a catalogue of interdisciplinary ownership (including naturalists, meteorologists, Egyptologists, colour theorists, interior decorators and British Prime Ministers) and the ways in which they interacted with this rare and textural chromatic dictionary. In doing so, it presents a material history of reading and handling – as well as extra-illustrating, collaging and graffitiing – a work of colour literature in the nineteenth century, revealing the diverse and diffuse applicability of an illustrated nomenclature of colours.

- **Max Donnelly** is Curator of Furniture and Woodwork 1800–1915 at the Victoria and Albert Museum, London, where he has curated several displays. He practiced and studied fine art in Edinburgh and London before working for dealers in New York and New Bond Street and appearing on the BBC’s Antiques Roadshow. V&A publications include a chapter on furniture in *C.F.A. Voysey: Arts and Crafts Designer* (2016), contributions to *The Story of Scottish Design* (2018), and the book *Christopher Dresser: Design Pioneer* (2021). His co-edited monograph, *Daniel Cottier: Designer, Decorator, Dealer* (2021), was published by the Paul Mellon Centre and received the 2021 Book

of the Year award from the Metropolitan Chapter of the Victorian Society in America. Max writes for journals including *The Burlington Magazine*, and has lectured in the UK, Europe, North America and China. He is a Fellow of the Society of Antiquaries of London and a Trustee of the Decorative Arts Society and the Emery Walker Trust.

‘Nature’s colouring’: Dr Christopher Dresser and the dissemination of colour theory

‘What a barren world ours would appear, were the ground, the hills, the trees and the flowers, the sky and the waters all of one colour!’ So declared Dr Christopher Dresser (1834–1904), botanist, theorist, writer, and Britain’s first independent industrial designer. Dresser holds a unique position in translating colour theory into practice. His colour theories developed from his training as a botanist and designer at the Government School of Design in London, those of his mentor Owen Jones, and his experience running a busy studio producing designs for interiors, wallpapers, textiles, stained glass, ceramics, and furniture.

This paper will focus on Dresser’s chapter on ‘Colour’ in *Principles of Decorative Design* (1873), a compilation of articles originally published in the *Technical Educator* and addressed to ‘working men’. Dresser laid out his colour theories, examining the relationship between colour and form and providing a summary of current scientific research, complete with ‘Analytical tables’, to guide artisans aiming to develop an understanding of the relationship of primary and tertiary colours, colour harmony and colour contrasts. He even encouraged readers to study colours produced by gas tubes ‘illuminated by electricity [...] and let the prism yield you daily instruction’.

However, Dresser’s chapter was more than a scientific treatise. Besides laying down scientific guidelines, he also encouraged readers to study examples of manufactures from India, China, and other cultures for inspiration. And while often evoking science, he strove to harness scientific phenomena in order to convey feelings and add ‘charm’ to interiors and manufactures. Dresser’s use of language and imagery, sometimes poetic and often spiritual or quasi-religious, will therefore be scrutinised. It underpinned his belief, embodied in the interiors and objects he designed, that colour had the power to transform the material world and improve design, which should, overall, ‘manifest the knowledge of our age’.

- **Ian Dooley** is a first year PhD student at the Institute of English Studies, School of Advanced Study (London, UK). Their thesis entitled ‘Printing Ink Manufacturing In Britain And Its Impact On Print Culture And Society: 1850-1900’, explores how industrial ingredients and methods for both black and colored inks fundamentally

changed printed material into chemical-industrial products; altering not only printed material, but British culture and industrial society. They are a former library worker at Princeton University Special Collections specializing in book history, 19th Century illustration techniques, curation, cataloging, and children's literature. They have delivered talks internationally, related to printing history and librarianship such as "Printing Ink in the Industrial Period 1820-1900" for London Rare Books School (2021) and "Preservation and Collections Care" at Azerbaijan State Pedagogical University (2019).

Chemical Colour: Evidence for 'Coal-tar' Pigments in British Printing Ink 1860-1910

For most of printing history, color printing was expensive and available colors were limited. Previous scholarship has highlighted how this changed during the late nineteenth century thanks to ever-faster printing machines and the meteoric rise of the chemical industry which produced cheap never-before-seen colors. But the indispensable intermediary between these two industries, printing ink manufacturing, remains unexplored by scholarship. By illuminating the contributions of the British printing ink industry during the late nineteenth century, my research demonstrates how ink manufacturers became the fulcrum between chemical science and machine production which revolutionized mass color printing.

The brief literature on the history of printing ink maintains that synthetic organic ("coal-tar") colors were at first celebrated but then quickly discarded when they were found to be impermanent. Evidence from technical literature about ink production, printing trade journals, and printing ink advertisements exhibiting printed colors (called "specimen books"), however, reveals that coal-tar pigments continued to be used in printing during the whole of this period and beyond. I argue that these pigments helped make possible technological and technical advances in color printing, especially color photomechanical images, and contributed to the blooming of mass print culture with its attendant consequences: art for all, photographic realism, and increased literacy and visual information.

My research bridges the gap between the history of chemistry, industry, and print culture, demonstrating how business actors designed new chemical products that had major aesthetic outcomes. My research complicates what are considered best practices for the storage, handling, and display of nineteenth century color-printed materials and highlights the need for further technical analyses of printed inkfilms. By assessing printing ink as a subject of research in and of itself, my research offers a new framework with which to conceptualize the impact of material production and composition on heritage objects of all sorts.

- **Kirsty Sinclair Dootson** is a lecturer in film and media at UCL. Her work explores the relationship between making and meaning in the visual arts. Her first book *The Rainbow's Gravity: Colour, Materiality and British Modernity* (PMC/Yale 2023) explores how new chromatic media technologies transformed Britain between the 1850s and 1960s, from Victorian breakthroughs in synthesising pigments to the BBC's conversion to chromatic broadcasting.

The Complexion of the Chromolithograph: Ink, Skin, Colour and Race in Late Victorian Print

This paper considers how the new colour printing technology of chromolithography changed the way racial difference materialised in British print through depictions of skin in late nineteenth century advertisements. Chromolithography was the first affordable technology for mass-producing colour images and transformed print advertising. It was widely used to promote imperial goods resulting from the intensified colonial expansion and commercial exploitation of Africa from the 1880s. Colour enhanced the visual appeal of these products, but also gave printers an expanded palette for exploiting racial difference as part of these advertising campaigns. Yet the addition of colour to a formerly monochrome medium raised questions about the relationship between skin colour and racial identity. How was it possible to render White skin in a variety of hues without it becoming, in the racist terminology of the time 'coloured'? Chromolithography also lent a distinctive surface pattern, or complexion, to the surface of these prints—a spotted and dotted configuration that complicated ideals of Whiteness and its supposed purity and colourlessness. How did this spotty surface intersect with ideas about skin colour and discoloration linked to disease and dirtiness bound up with class and labour, as well as desirable and undesirable colouration dictated by the racial hierarchies of Victorian beauty standards? Through a close examination of Pears' Soap advertisements, I reveal how the surfaces of these prints became a space for materialising ideas about British racial identity in an era of colonial expansionism. By closely examining chromolithography's materials and techniques (particularly the use of soap, soot, and water) I argue that through colour printing the racial taxonomies of Blackness and Whiteness accrued not just different aesthetics, but different meanings, meanings that were fundamentally bound up with the techno-material processes of colour printing.

- **Caroline Douglas** is an artist working with photography. She is currently undertaking a PhD by practice at the Royal College of Art entitled *Retouching the Archive: Gender and Class in Early Photography in Scotland*. Her practice she works with photography, writing and creative archival research processes to work cross-historically, re-touching the archive, to recover and repair marginalised histories. This project has been supported with an AHRC-techné Scholarship. This year (2023) she was awarded the Royal Photographic Society Postgraduate Bursary, the Scottish History Society Alasdair Ross Prize and an award from the Society of Dyers and Colourists for her forthcoming research on Mary Somerville and early photography. In 2020 she was the recipient of the Paul Mellon Centre Andrew Wyld Research Support Grant for *Retouching the Archive*. Selected exhibitions include; Galerie Huit, Rencontres d'Arles International Photography Festival, Stills Gallery, Edinburgh, Columbia University, New York, Brighton Photo Fringe, Format Festival, The Magenta Foundation, St Andrews Photography Festival and the Royal College of Art Research Shows held across London at Asylum, Assembly Point, Beaconsfield, Copeland Galleries and Southwark Park Galleries. Her residencies include; Stills Gallery, Edinburgh, Photography MA, School of the Art Institute Chicago, AiR Fondazione Fotografia, Modena, Italy, Proekt Fabrika, Moscow. She was Visiting Scholar at the University of St Andrews (2017). She is a lecturer in Fine Art Photography at The Glasgow School of Art.

Pioneers of Colour: Fulhame and Somerville's Protophotography

This paper takes two women of science, Elizabeth Fulhame (fl. 1794) and Mary Somerville (1780– 1872) and explores their contribution to the field of colour in proto and early photography. Both Fulhame and Somerville have been overlooked as inventors of the medium. As marginalised women in the sciences, they were gendered intruders whose works represent disruptive case studies in colour in early photography. This paper explores their output and sets it against the silences of the archive, where colour photochemical experiments exist today only in written word (Fulhame), or in unfoliated colour anotypes test strips (Somerville). In bringing research and art practice together it asks if re-enactment can become a method for critical inquiry. How might re-enacting chemical, optical and sun bleaching experiments lead to new findings and understandings of early colour photographic processes? In the artistic recreation of their experiments, a physical encounter emerges. So too does a methodology that can perhaps offer

us an understanding of the perception and experience of colour and photo chemicals in this earliest of periods – seven decades before

James Clerk Maxwell's declaration of colour photography. By revisiting and re-enacting Fulham and Somerville, this paper presents some of the invisibilities of women's work in colour in early photography.

- **Arnaud Dubois** is an anthropologist, CNRS Researcher at the Musée de l'Homme in Paris (French National Centre of Scientific Research, UMR 7206 Eco-anthropology), and a member of the CHROMOTOPE team, in charge of the ChromoBase, the database of the project. He holds a doctorate in Social Anthropology from the École des Hautes Études en Sciences Sociales (EHESS) and an MFA from the École des Beaux-Arts, Paris. He was a visiting researcher at the Musée du Quai Branly, a Fyssen Foundation postdoctoral fellow at University College London, a research associate at the Conservatoire National des Arts et Métiers and a professor of anthropology of art at the École Nationale Supérieure d'Art et de Design-Limoges. His research interests focus on anthropology of colour, the relations between aesthetic, technology and society and the link between art, craft, and industry. He has conducted fieldwork about colour practices in France and archival research on colour heritage in international museums of contemporary art, anthropology and science and technology in France, Switzerland, the U.S., and the U.K. He is the author of *La vie chromatique des objets, une anthropologie de la couleur de l'art contemporain* (Brepols 2019) and *Les Meilleurs Ouvriers de France* (Skira 2017), and co-editor of *Understanding Use* (Smithsonian Scholarly Press 2023), *Gestes et savoir-faire (dé)possédés* (Ethnologie Française 2022) and *Arcs-en-ciel et couleurs* (CNRS 2018).
- **Helena Neimann Erikstrup** is a current doctoral student in History of Art at St John's College, University of Oxford.

The Colours of Martinique: Victor Fulconis's studies of people and landscape

The paper examines an album of drawings, which the Algerian-born artist Victor Fulconis (1851- 1913) created in 1883 in the French colony of Martinique, where he also later became the Mayor. The album, held at the Departmental Archives of Martinique, is a unique, and scarcely studied source, which enriches our understanding of the correspondence between

colour as a racial marker and as a pigment in late nineteenth century. The paper follows Jordanna Bailkin (2005) and Natasha Eaton's (2013) prompt to think about the politics of the pigment in the Atlantic World, using the example of Fulconis to consider questions of the colonial palette; colour and the racialised body and; colour and modernity in Euro-Caribbean art histories. The first part of the paper interrogates Fulconis's drawings of the population of Martinique, in which he repeatedly draws the human figures of the mixed-raced population on the island, making the variety of racial categories readable through colour. The second part of the paper focuses on his studies of the natural environment, where he, as with his representation of the population, takes on a systematic approach to record the animals, flora and fauna of Martinique. The paper contents that Fulconis's intricate and brilliant coloured representations of both the people and the tropical landscape are an attempt to not only capture but also to categorise life on the island, as a means of managing and making sense of what he encounters. It shows how Fulconis creates an intimate relationship between race and ecology in the album, and how both became vital sites in which colour was used as a way of shaping, justifying and conveying information about the imperial enterprise in Martinique. The paper contributes to the very limited scholarship on Fulconis and his use of colour, and more broadly, to our understanding of Martinique as an important site of colour: as once an indigo-producing colony and as continuously a space in which colour, as a racial marker and as a pigment, were negotiated.

- **Ariane Fennetaux** is Professor in British history at Sorbonne Nouvelle University. Her research and publications focus on material culture with a particular emphasis on textile and dress. Her book, *The Pocket: A Hidden History of Women's Lives 1660-1900*, co-authored with Barbara Burman, was published in 2019 by Yale University Press. In 2022, she co-edited with John Styles, *The Holker Album. Textile Swatches and Industrial Espionage in the 18th century* (Musée des Arts Décoratifs, 2022).

An Empire of colour: nature and the stuff of feather dyeing in the late 19th century

With the rise of Empire from the 18th century and the discovery (in the West) of new 'exotic' bird species, some unprecedented colourful feathers entered the material and chromatic vocabulary of the fashion trades in the West. In the context of the massification of demand for fashionable feathers, the unavoidable decrease in stock and the rise of bird protection societies in the late 19th century, farmed feathers and in particular farmed ostrich feathers came to play an increasingly prevalent role in the provision of feathers for the fashion trades. Unlike other

more colourful exotic birds however ostrich feathers remarkably lacked colour being in their natural state either whitish or brown, sometimes black but rarely of a consistent, bright or lustrous shade. This contrasted with the increasingly difficult to obtain plumage of birds of paradise, hummingbirds or kingfishers with their iridescent or brightly coloured feathers which had been so attractive to the fashion trades.

With farms implanted in South Africa or California, ostrich feathers were a global commodity traded across the world with New York, London and Paris acting as centres of the international feather trade (Stein 2008). Along this global market, new techniques and processes for dyeing these feathers now produced on a massive scale also developed. If some feather dyeing recipes borrowed from textile dyeing techniques which had been so radically transformed by the chromatic revolution brought about by the advent of aniline dyes, feather dyeing was also a field of its own in which the new chemistry of colours that resorted to aniline and similar components, combined with the persistent use of more traditional natural components such as turmeric, orchil or logwood which came from various parts of the world – ranging from South America to India and Africa. With their bright, sometimes almost garish colours, dyed feathers also struck a fascinating balance between nature and artifice. If shape, texture and movement made them conspicuously nature-like, colour was the one element that unmistakably made them other.

Based on research carried on into ostrich feather farming and dyeing in the last quarter of the 19th century and on close study of material sources, in particular of feathers prepared for the fashion trades, the paper will map out the global circulation of feathers and their dyeing ingredients linking this global circulation to issues of trade, industrialisation and the science of colour being applied to an organic, animal, material. It will also look at feather dyeing in the context of empire, and the peculiar relationship to nature it fed as well as within the context of the new chromatic relationship to the world brought about by the global circulation of goods and the advent of a new chemistry of colours.

- **Tea Ghigo** is a lecturer in the History of Art, Materials and Technology at University College London. She trained as a Heritage Scientist in Turin and Genoa (Italy) before obtaining her joint PhD in Archaeometry from the University of Hamburg and the University of Rome la Sapienza. Her research focuses on the characterisation of materials from manuscripts and paintings from different historical periods, with a particular focus on colourants. She combines non-invasive material analyses with traditional archival research to help shape new perspectives on heritage collections. Tea

has a particular interest in exploring social, cultural, technological and anthropological aspects that might have shaped specific material choices. Her doctoral dissertation looked at the black pigments used as writing materials in Late Antique Egypt and revealed an unexpected correlation between the genre of text written (literary vs documentary) and the type of ink used. In 2020, she moved to the Ashmolean Museum in Oxford as a member of the project CHROMOTOPE, where she started exploring artists' attitudes to industrial painting materials in light of the 19th-century Colour Revolution. Tea designed and authored her current project, which was recently awarded the Seal of Excellence by the European Commission. This research aims to perform the first-ever material characterisation of the watercolours from John Ruskin's teaching collection, preserved at the Ashmolean and is presently carried out thanks to funding from the Leverhulme Trust. From October 2022, she holds a position as Junior Research Fellow at Linacre College.

19th-century attitudes to industrial colour: John Ruskin, the artist behind the author.

The 19th-century industrialisation of colour manufacture, prompted by scientific and technological progress, gave rise to new ideas and attitudes towards colour materials that continued to evolve throughout the century. Born into the second generation to live through this transitional period, John Ruskin—one of the major authors of this period and an accomplished watercolourist—frequently opined on the main events that marked this era. His copious penmanship has contributed much to building our modern perception of Victorian England. In the following famous passage, he commented bitterly on the introduction of “Magenta”, the second coal-tar dye discovered after “Mauve”.

“We moderns, who have preferred to rule over coal-mines instead of the sea [...], have actually got our purple out of coal instead of the sea! And thus, grotesquely, we have [...] completed the shadow, and the fear of it, by giving it a name from battle, Magenta.” —*The Queen of the Air, 1861*

The adamant position Ruskin takes on the production and commercialisation of aniline dyes, together with his well-known frustrated contempt towards the effects of industrialisation on nature and society, contributed to spreading the idea that he must have entirely avoided synthetic materials during his activity as an artist and professor.

My contribution challenges this understanding by combining evidence from archival research on Ruskin's texts and material analyses performed on selected watercolours from his teaching collection. It aims to cast new light on the relationship between Ruskin and his painting

materials and redefine our perception of it. I will demonstrate that not only Ruskin used synthetic pigments, but he did so intentionally. Finally, I will contextualise the results presented by examining the reasons that might have guided Ruskin to make specific material choices, thus revealing his intentions as a watercolourist and art professor.

- **Victor Gonzalez** obtained a PhD in Chemistry from UPMC University and the C2RMF in Paris. After a post-doctoral position at TU Delft, he joined the Rijksmuseum as a junior scientist, researching the materials and techniques of Old Masters. After this, he returned to France on a Marie Curie European Fellowship, hosted at the PPSM, where he worked on understanding the weathering mechanisms of modern pigments for two years before joining the CNRS as a research fellow (École Normale Supérieure Paris-Saclay).
- **Amanda Briggs Goode** is Head of Department for Fashion, Textiles and Knitwear Design at Nottingham Trent University (NTU). She has published widely on archives and lace heritage and curated the highly successful 2018 exhibition *Lace Unarchived*. This research has been undertaken alongside colleagues working in the NTU Lace Archive. Research Fellow, Dr Gail Baxter, is a lace specialist whose knowledge covers the making, design and interpretation of both hand and machine made laces. Research Assistant, Jayne Childs, has a particular interest in historic and contemporary machine-embroidered lace, text insertions and the use of machines for making lace.

Colour in Lace: Novelty by design

In the long nineteenth century lace was mainly experienced in black or white, however the Nottingham Trent University Lace Archive demonstrates a more colourful side to machine-made lace. The archive collection is built upon the material used for teaching lace design since the School of Art opened in 1843, consisting of circa 75,000 items including books, technical material, and lace samples.

The principles of colour were a key component of the 19th century Municipal Curriculum and examples of examination work demonstrate this area of learning. The importance of colour in fashion was taught through access to contemporary publications such as *The Englishwoman's Domestic Magazine*, with its hand-coloured plates and fashion reports.

The methods of applying colour to lace is an under researched area, perhaps because dye-houses were often combined with other ‘finishing’ trades such as bleaching or dressing (Mason, 1994:153). We do not know what proportion of the manufactured lace was dyed but Murfet (1991) lists 54 dyers servicing 360 lace manufactures in 1876.

This research considers the material evidence of how designers selected their approach to the colouring of machine-made lace, across a number of options: pre-dyed threads, post production single and cross-dying, and surface applied colour. Lace sample books from the collection demonstrate these uses, offering an insight into the application of the lace designers colour training and the technical limitations for colour application of the time. They also demonstrate changing colour tastes over time as well as the naming of colours.

- **Anne Grady** joined the staff at The Metropolitan Museum of Art in 2016 but has regularly worked on capital projects in the Department of Objects Conservation since 2008, when she was a Sherman Fairchild Conservation Fellow. She is responsible for post-Renaissance European and American decorative arts. Prior to that, Anne was a staff member of the Museum of Modern Art and a fellow at the Los Angeles County Museum of Art, where she worked on a wide range of sculpture and design objects. She received her BA from Oberlin College and an MA in art conservation from Buffalo State College.

Color at Tiffany & Co.

During the second half of the nineteenth century, silversmiths and designers at Tiffany & Co. committed themselves to investing a traditionally monochromatic medium with color. This paper presents research investigating the alloys and related decorative techniques used in inlaid silver objects produced at Tiffany under the direction of Edward C. Moore (1827–1891), the head of Tiffany’s silver division from 1851 to 1891.

A pioneering silversmith and avid collector, Moore amassed a vast collection of works of art ranging from Greek and Roman glass to Japanese ceramics, textiles, and baskets. His extensive library included hundreds of volumes dedicated to science, nature, and industrial technology. Moore’s diverse collection was the source of aesthetic and technical inspiration for most of the silver produced under his guidance. Tiffany’s silversmiths skillfully worked together different metals, including alloys of gold, silver, copper, and iron, and experimented with alloying, casting, electrotyping, chasing, etching, inlaying, electroplating, and patination, often drawing inspiration from Japanese and Near and Middle Eastern metalsmithing traditions.

Works designed and created at Tiffany during Moore's tenure have been analyzed by optical microscopy, X-radiography, and X-ray fluorescence spectroscopy. Results from this investigation shed new light on the alloys used by Tiffany & Co. and provided the unique opportunity to compare them to Tiffany's unpublished technical manual. In addition to pure metals, such as copper, silver, and gold, various alloys were used to decorate sterling silver objects, including different types of brass, binary alloys of copper and gold, copper and platinum, and gold and silver, ternary alloys of copper, platinum and iron, copper, silver and gold, and silver, copper and zinc. These metals were often patinated using different solutions to achieve various tones—ranging from red to black to purple— and effects. They were also combined to obtain laminated inlays with elaborate patterns, similar to the Japanese technique of *mokume-gane*. With these techniques and the colors they realized, Tiffany revolutionized silver design and production.

- **Sarah Hardy** graduated from Durham University with a degree in History of Art in 2010, before obtaining her Masters Degree in History of Art and Visual Culture from the University of Manchester in 2012. Sarah worked at the National Gallery and British Library in London before becoming the Director of the De Morgan Foundation in 2018. Sarah has curated and delivered the exhibitions 'Sublime Symmetry: William De Morgan's Mathematical Design', 'Artist of Hope: Evelyn De Morgan's WWI Paintings' and is co-curator of the exhibition 'A Marriage of Arts & Crafts'. Sarah has published widely on Victorian art, on topics such as Edward Burne-Jones's illustrations for the Kelmscott Chaucer and, most recently, a chapter of Evelyn De Morgan's views on materialism. Sarah is also a Trustee of the William Morris Society and Museum.

Visions in Gold

Evelyn De Morgan was one of only two artists who created ethereal drawings in gold pigment on dark paper in the late-19th century. They range from sketches for angels and Greek goddesses to full compositional studies of her oil paintings.

A full assessment of these works and a programme of work to conserve them for display has recently been undertaken to prepare these works for an exhibition. Close study of the works has revealed that Evelyn De Morgan was a technical and experimental artist. She regularly bought dry pigment 'cakes of gold' from the artists' colourman Charles Roberson and used these to create a range of wet and dry materials to realise her gold drawings.

The only other artist known to work in this unusual media was Edward Burne-Jones. In this paper, I will compare and contrast gold drawings by both artists to demonstrate that they were perhaps more different than they were similar. Their reasons for selecting the media were opposed, as were their general approach and processes in creating them. This paper will support an exhibition of Evelyn De Morgan's gold drawings at Leighton House Museum, which will be open to the public at the time of the conference.

- **Amy Hare** first encountered the RSN while a post-graduate student at the University of Oxford in 2017, and since 2019 has been a Senior Lecturer in Contextual Studies on their undergraduate programme where she uses the RSN collection and archive to teach the next generation of embroidery practitioners. Amy also gives online public talks about the history of the school and embroidery more generally, and she has been a contributor to the RSN collection re-cataloguing and digitisation project. Amy has a particular research interest in Art School pedagogies of the twentieth century, embodied knowledge and knowledge networks of craft practice. Amy's has a pre-academic professional background in the world of period costume making and she is currently a lecturer in Costume for Performance at UAL. In 2022 Amy began a AHRC funded PhD research project at Kingston School of Art where she is investigating the craft practice of period costume making in the 20th century.
- **Medill Higgins Harvey** oversees the collections of American silver, jewelry, and other metalwork, as well as mid-nineteenth-century furniture. She joined the staff of the American Wing to direct research for the exhibition *Art and The Empire City* (2000). Medill is co-author of *Early American Silver in The Metropolitan Museum of Art* (2013) and a contributing author for *American Silver in the Art Institute of Chicago* (2016). Her most recent publication is *Collecting Inspiration: Edward C. Moore at Tiffany & Co.* (2021), written to accompany an exhibition that will be mounted at The Met in 2024. She is also a co-author and a consulting curator for *Modern Gothic: The Inventive Furniture of Kimbel and Cabus, 1863-82* (2021), an exhibition and catalogue produced by the Brooklyn Museum. Medill graduated Summa Cum Laude from Dartmouth College with a BA in art history, graduated with distinction from The Works of Art Course at Sotheby's Educational Studies in London, and was awarded a master's degree with honors in Decorative Art History by the Cooper Hewitt Museum / Parsons.

- **Alison Hulme** is a Professor of Synthesis and Chemical Biology at the University of Edinburgh. Although a synthetic organic chemist by training, she has a long-standing interest in natural products which first led her to collaborate with National Museums Scotland over 20 years ago. She has a unique interdisciplinary perspective, which has led to her group pioneering the use of analytical techniques such as LC-ESI-MS, UHPLC and DESI-MS to the analysis of natural product and early synthetic dyestuffs in heritage science settings. She has more than 20 publications relating to historical dyestuff identification with over 1000 citations, including one of the key reviews of the field (ChemSocRev, 2004).
- **Dominic Janes** is Professor of Modern History, Keele University, and a Professorial Fellow, University for the Creative Arts. He is a cultural historian who studies texts and visual images relating to Britain in its local and international contexts since the eighteenth century. Within this sphere he focuses on the histories of gender, sexuality and religion. His latest books are *Freak to Chic: 'Gay' Men in and Out of Fashion after Oscar Wilde* (Bloomsbury, 2021) and *British Dandies* (Bodleian Publishing, 2022). He has been the recipient of a number of research awards including fellowships from the AHRC and the British Academy.

Queer colours and student life in late Victorian and Edwardian Oxbridge

The Sexual Offences Act (1967) was intended to legalise male homosexual sexual acts in England but only when they were carried out in private. It was not expected that ostentatious displays of same-sex affection would suddenly become commonplace. Before this date homosexuality was associated with the behaviour of what were widely seen as sexual deviants. It was supposed that such men were often androgynous and would, if given the chance, dress in colourfully 'effeminate' styles. This paper explores the nature of these stereotypes and addresses the question of whether they bore a close relation to reality. It does this by focussing on a case study of images of so-called 'aesthetic' students at Oxbridge. These were individuals who, it was alleged, looked to the cultural and sexual example of Oscar Wilde.

To be colourful, particularly to be a man who dressed colourfully, was to court attention. Flowers were, in general, associated with the feminine realm. All of this helps to explain the apparently histrionic response of newspaper writers to the appearance on Wilde's person of a

green-dyed carnation in 1892. The result betrayed its artificial origins since the result was not a true green but a strangely metallic, blue-green color. But were students also experimenting with colour at this time?

Certainly, all this did not go unnoticed on campus. Student periodicals participated in either aesthetic expression or parody of it before and after Wilde's trials of 1895. The use of colourful sports blazers provided one arena in which particular combinations of hues were critiqued. In addition, particular shades were singled about as being 'queer'. The word meant unusual but, in the light of the aforementioned events, its employment might be seen as bearing some relationship to gender performance and sexual preference. The materials are primarily housed in college archives which preserve not only textual discussion and caricatures but also, on occasion, swaths of cloth which can help us to connect several themes of the conference: colour naming and classification, colour practices in universities, colour and the gendered body and materials in the archives.

- **Susan Kay-Williams** is the Chief Executive of the Royal School of Needlework, a post she has held for 16 years. Her research interest is in the history of dyestuffs and their use in textiles. Her first book was the *Story of Colour in Textiles* published by Bloomsbury in 2013. Since then, she has been researching the developments in dyeing in the 19th century and has a collection of 19th century dye charts and books as the starting point for her research, especially investigating the naming of new colours. She has had papers published on some of this work in *Dyes in History and Archaeology*, as well as giving an overview of dyeing for the 50th anniversary edition of *Textile History*. As CE of the RSN she has curated many exhibitions of historic and contemporary hand embroidery including the 150th anniversary exhibition at the Fashion and Textile Museum in London in 2022. She has also researched and written the history of the RSN *An Unbroken thread 150 years of the RSN* published by ACC Books in 2022. Susan is President Elect of the Society of Dyers and Colourists (founded 1884), the professional body for the education and promotion of colour technology and use, a role she will take up in May 2024.

“That chastened delight which all beauty, tempered by fitness bestows”: *Colour, Artistry and Modernity at the Royal School of Art Needlework, 1872-1910*

Authors: Susan Kay-Williams, Amy Hare

The establishment of Art Needlework as a distinct artistic practice in the latter part of the nineteenth century, is a relatively unacknowledged actor within the Arts and Crafts movement, but in 1872 the Royal School of Art Needlework was founded as a unique all female organisation that took the ideals of 'Art for Art's sake' and combined them with a determination to provide meaningful employment for 'necessitous gentlewomen', and created a unique pedagogy and business model that used the perception of colour in the modern fashionable interior as a founding principle.

Recent research in the school archives has revealed how the systematic teaching of colour was an essential part of an innovative curriculum, steeped in the examination of historic textiles placed the RSAN at the heart of the Arts and Crafts movement and at the forefront of wider social reform, with colour as the unifying factor that was present in almost all aspects of their work. The revival of lost chromatic skills such as 'optical blending' for silk shading were considered the highest achievement of an Art Needleworker, and the desire for authentic colour led to the school setting up a dye room where students could experiment with archaic natural dye recipes. Beyond the practical and methodological concern for colour in needlework, the treatment of colour was considered the agent of harmony, the unifier of truly beautiful design. The founders of the RSAN considered colour as indicative of a nuanced sense of the past and in doing so embraced modernity. By examining the early years of the school through its attitudes to colour, I propose that we can understand how material and abstract notions of colour became fashionable symbols of a tangible past and modern sensibility in the home and in elite society. Therefore, this research also provides greater insight into how colour in this context served as a response to mass production and mass consumption, creating new discourses of gender, exclusivity, distinction and that most modern middle-class value, taste.

- **Kathrin Kinseher** is head of the studio for painting-materials and techniques at the Academy of Fine Arts in Munich (since 1995). From 1991-1995 she was employed as a paintings conservator by the Wallraf-Richartz-Museum and Museum Ludwig in Cologne. Kathrin holds a diploma (1991) in the conservation and restoration of art and cultural property from the TH Cologne. She obtained a PhD from the Technical University of Munich (2014) with a thesis on the development of painting materials' research in Munich in the late 19th and early 20th century. Her latest contribution was published in the book "Histories of Conservation and Art History in Modern Europe" edited by Sven Dupré and Jenny Boulboulé, under the title "We Cannot Splash Light onto Our Palettes": The 1893 Munich Exhibition and Congress and Its Public Demand

for Research on Painting Materials and Techniques, Routledge, London 2022. Her field of study includes: the history of painting materials' research in relation to the themes of her PhD thesis; history of artists' materials and techniques; materials and techniques of modern and contemporary artists; methods of teaching the subject of painting-materials and colour at art academies. For selected publications and conference presentations please see <https://www.adbk.de/de/akademie/kollegium/leiter-innen-studienwerkstatt/241-kathrin-kinseher.html>

Colour in court. Concerns about the quality of artists' pigments

Progress in the chemical pigment and dye industry caused a growing number of shades in artists' and commercially used colours. In the late 19th century suppliers offered a wide range of yellows, reds, browns, greens and blues. This variety of hues was also achieved by mixing, blending and extending pigments. However there was little to no information about the composition and permanence of colours as well as a discrepancy of trade names and contents.

Similar to the artist Holman Hunt in England, the German chemist Adolf Wilhelm Keim was a restless fighter against the production and use of poor-quality materials. With funds from the *German Society for the Promotion of Rational Painting Methods*, he had established a laboratory for testing and controlling painting materials of all types of application.

He had also proposed a list of reliable pigments, the so-called *Normalfarbenskala*. This kind of restricted selection of pigments was intended as a distinct step against the widespread supply of low quality and adulterated colours.

Keim's dismissive attitude towards manufacturers and suppliers culminated in a court case. Keim was accused of damaging the business of a German colour factory (Schröder & Stadelmann) through an insulting statement in his book *Ueber Mal-Technik* (1903). The court prohibited the distribution of the book as long as it contained the offending passage.

This court case represented a more general and growing conflict between opposing parties: on the one hand, colour industry and distributors and on the other, artists and craftsmen who demanded reliable materials and transparency in pricing.

Consequently the importance of testing paints by scientific laboratories was strengthened, and additionally representatives of suppliers and customers entered into negotiations at the *Kongress zur Bekämpfung der Farben- und Malmaterialfälschungen* (1905). [Congress to combat the adulteration of colourants and painting materials]

- **Agnès Lattuati-Derieux** is an analytical organic chemist. She holds an Habilitation à Diriger des Recherches and a PhD in analytical organic chemistry from Paris 6 University and Chimie Paris Tech. After having worked in different French academic laboratories, she joined in 2018 the Research department of the Centre de recherche et de restauration des musées de France (C2RMF) and became member of the CNRS institute IRCP (UMR 8247 Chimie-ParisTech, PSL University). As head of the Organic Materials group of the C2RMF, she is in charge of characterizing the organic materials (natural and synthetic) involved in artifacts from all public museums in France (about 1220) and from some excavation sites (Lavau in France and Byblos in Lebanon) that require C2RMF support. She became an expert on organic fraction analyses such as food residues contained in archaeological materials, varnishes, binders, (proteinaceous and polysaccharide) adhesives and waterproofing substances. Her analytical expertise concerns separation techniques coupled with mass spectrometry (high and low resolutions). She is involved as coordinator and partner in various national and international projects dealing with organic materials that could be present in any art and archaeological objects with all typologies from archaeological periods to more contemporary one. Eager to pass on her knowledge and passion, she teaches the materiality of artworks in various training lectures. She also supervises PhD and post-doc students that deal with organic materials investigation. Lastly, she is in charge of organizing monthly cultural heritage seminars at the C2RMF open to the public and she is keen to promote and disseminate the results of her research group through articles, papers and interviews.

The colour black in Parisian furniture in the 19th century: materiality, meaning and social heritage

Authors: Joana Ferreira de Sousa, Marc-André Paulin and Agnès Lattuati-Derieux

From the 17th to the 19th century, furniture-making was subject to various innovations which transformed it from craft to art. Over 300 years, recurrent international exchange, technological and artistic discoveries and inventions led to the fiscal and artistic enrichment of certain European countries. In Paris, the artistic capital of European furniture production, the art of the cabinet-maker, the significance of the colour black and the great wealth of the city entered into a fascinating dialogue. The sociocultural heritage of the colour black in the 19th century will be the subject of our poster.

We will focus on large-scale furniture made by cabinet-makers, often veneered, with the colour black (originating from ebony, vegetal dyes produced from calcinated wood, lacquer, etc.) but also stained or otherwise chemically-created blacks. We will present the materiality - i.e. the materials and techniques used to create black – with a particular focus on the long nineteenth century. This approach correlates closely with the history of the use of the colour black in France, how blackness imposes or invites itself onto furniture, and thus how it evolves with the times, follows fashions, and is linked to and affected by the ever-changing political landscape in France.

- **Milda Lebedytė** is a Research and Development Chemical Engineer working in the textile analysis and textile recycling fields. She has a keen passion for the chemistry related to the textile industry. Her interest started at the University of Edinburgh where her BSc thesis focused on the characterisation of 19th century synthetic dyes using UHPLC-PDA. She continued on to obtain a MSc at Heriot-Watt University investigating the chemical recycling of wool fabrics into a novel fibre for commercial applications. Currently at Refact (www.refact-textile.com), her work focuses on the chemical fibre-tofibre recycling of end-of-life waste textiles in a viscose dope process. Contact email: milda.lebedyte@refact-textile.com
- **Loa Ludvigsen** is imaging specialist and paintings conservator at the National Gallery of Denmark (SMK). She holds a MSc in paintings conservation from the Royal Danish Academy of Fine Arts, School of Conservation (2009) and worked at the National Museum of Denmark, until her employment by the SMK in 2014. Since 2017, she has divided her time between analytical imaging at SMK including X-radiography, Infrared Reflectography and condition- and treatment-related imaging for the painting. Most recently, she has made technical studies of a selection of Matisse paintings. At present, she is part of the research team investigating the renowned Danish artist, Vilhelm Hammershøi's painting technique and materials. The aim of the ongoing research project *The Vilhelm Hammershøi Digital Archive* (ViHDA) at Statens Museum for Kunst (SMK) in Copenhagen is to increase our knowledge of Hammershøi's painting technique. The project includes visual and technical examinations, scientific analysis and registration of paintings from Danish and foreign public and private collections. The project will result in an open access digital archive, available for scholars and the

public. Loa has a profound interest in the technical examination of easel paintings, but is easily lured into investigations of all sorts of materials. Loa has published on pigments and painting materials in articles on *Prussian blue in Denmark*, *ground layers in Italian baroque paintings* and *the painting technique of Matisse*. She was formerly the editor-in-chief of the peer-reviewed conservation periodical *MoK* and Assistant Coordinator for the ICOM-CC Documentation Group.

- **Rosarosa Manca** is a Research Fellow at the Earth Sciences Department of the University of Florence, Italy, where she graduated in Heritage Science *summa cum laude* and completed a PhD degree in Earth Sciences with the dissertation ‘Non-invasive, scientific analysis of 19th-century gold jewellery and maiolica. A contribution to technical art history and authenticity studies’. Her academic training has taken place in an interdisciplinary setting, studying the application of analytical techniques to the study of cultural heritage materials and their conservation. Her research is focused on the study of geomaterials of cultural interest, and specifically of pigments, tin-glazed pottery and jewellery in museum collections. She collaborates with a number national and international museums (Victoria and Albert Museum, Musei Nazionali del Bargello, Museo Nazionale Etrusco di Villa Giulia, Museo della Ceramica di Montelupo, Museo di Storia Naturale di Firenze) and research institutions (Consiglio Nazionale delle Ricerche, Opificio delle Pietre Dure, Centro Nacional de Aceleradores). She is supervisor and co-supervisor of BSc and MSc theses and gives classes to MSc and PhD students. She is a board member of the National Association of the Experts of Diagnostics, Sciences and Technologies Applied to Cultural Heritage (ANEDbc) and a member of the Italian Association of Archaeometry (AIAr), the Italian Society of Mineralogy and Petrology (SIMP) and the International Council of Museums (ICOM).

Tradition and innovation in the 19th-century revival of Italian maiolica

Authors: Rosarosa Manca, Lucia Burgio, Marco Benvenuti

After the technological and aesthetic heights reached during the Renaissance, Italian maiolica (tin-glazed pottery) lived a renewed popularity in the 19th century. Important manufactories and ceramists, such as the Ginori and the Cantagalli firms in Florence and Torquato Castellani in Rome, promoted the revival of this art form, resuming the iconography, style and colour palette of medieval and Renaissance models. In parallel, new elements and compounds became available thanks to the Industrial Revolution and started to be used as pigments, colourants

and opacifiers for glassy materials. The present study concerns the compositional analysis of the glazes of a selection of maiolica wares of the Victoria and Albert Museum, with the aim of acquiring for the first time a large dataset on this period and understand which of the 19th-century newly introduced materials were used in the production of maiolica, possibly replacing traditional ones. Non invasive, *in-situ* analyses were performed by X-ray Fluorescence spectroscopy (XRF) on twenty-one wares made by Ginori, Cantagalli and Castellani between 1855 and 1900, two Renaissance models, and one Renaissance plate with 19th-century additions.

The ground glazes of the 19th-century maiolica analysed are overall comparable to those of the Renaissance ones, indicating a precise reproduction of the traditional technique by the revivalist makers. However, modern materials were also detected. Zinc oxide was widely used to improve the optical properties of both white and coloured glazes. Chromium-containing pigments were detected in several colours by Cantagalli and Castellani. Peculiar lustres containing gold, bismuth and uranium were identified in a dish made by Castellani in 1870, while in earlier objects the ceramist employed the traditional copper and silver lustres.

- **Fiona Mann** completed her PhD at Oxford Brookes University in 2012 on the impact of new art materials and pigments on watercolour painting techniques in England during the second half of the 19th century and on their critical reception in the press. Her paper on Watercolour Painting Manuals and the Advancement of Watercolour Practice in England 1850-1880 was presented at an ICOM conference in Stuttgart in 2016 and the following year the Courtauld Institute invited her to present their biannual Richard McDougall lecture on British watercolour painting post-1750. In 2019 she gave a keynote lecture on Reassessing Burne-Jones's Early Oils at the conference held in conjunction with the major Burne-Jones exhibition at Tate Britain. She has published articles in the Burlington Magazine on Burne-Jones's watercolours, based partially on an analysis of his accounts in the handwritten ledgers of the colourman, Charles Roberson at the Hamilton Kerr Institute archive; and contributed to an article published online by Tate Papers on the Making of a Triptych: The Annunciation and Adoration of the Magi 1861 by Edward Burne-Jones. Other publications include a chapter for an anthology on Victorian Artists' Replicas, edited by Professor Julie Codell and published by Routledge. In 2020 she researched and wrote a chapter on the techniques of George Price Boyce, Dante Gabriel Rossetti and Edward Burne-Jones for Professor Christiana Payne's catalogue for the Pre-Raphaelites: Drawings and Watercolours

exhibition, held at the Ashmolean Museum during 2022. To coincide with the Ashmolean exhibition, she presented an online talk on Burne-Jones's experiments with traditional media, in particular with vellum and gold. Her current research returns to her fascination with the painting techniques of Rossetti, particularly with his early watercolours; his important commission for Llandaff Cathedral; and his relationship with patrons George and Julia Rae.

‘Rather revolution than evolution’: the new pigment CHINESE WHITE and its effect on watercolour painting techniques in England 1850-1880

The introduction in 1834 of Winsor & Newton's new white pigment, called 'Chinese white', after the fashion for the type of porcelain popular at that time, provided watercolour artists for the first time with an opaque, permanent and stable pigment which could safely be mixed with other colours. It also did not blacken or discolour on contact with the toxic hydrogen sulphide fumes filling the air in Victorian cities. So popular was it, that the streets around the Winsor & Newton's London premises rapidly became blocked with carriages as people rushed to buy the product.

Rapidly adopted by many of the leading watercolour painters of the day, either for mixing directly with other colours (to create bodycolour), as recommended by John Ruskin, or for applying as an initial priming, it transformed the appearance of watercolour painting. Samuel Palmer wrote that a white priming 'is to a brilliant picture, what the outside light is to a stained glass window.' Such dramatic effects were often noted with alarm in the press by critics, who questioned the 'legitimacy' of such a technique compared with the gentle traditional transparent washes of previous generations.

This paper will examine the impact of this revolutionary new pigment on watercolour painting techniques during the second half of the nineteenth century in England and the critical reaction to these developments.

- **Kirsten Travers Moffitt** is the Conservator and Materials Analyst for the Colonial Williamsburg Foundation in Virginia. She specializes in historic paint and pigments, particularly those related to objects and architectural settings. She received her M.S. from the Winterthur/University of Delaware Program in Art Conservation with a specialization in painted surfaces and is adjunct faculty at that program, where teaches Polarized Light Microscopy and Cross-section Microscopy courses to conservation graduate students. She helped organize and co-edited the post-prints for the 6th

International Architectural Paint Research Conference in 2017, *Micro to Macro: Examining Architectural Finishes* (Archetype, 2018) which includes her paper “Limewashed Island: Architectural Finishes in Early Bermuda”, co-authored with Ed Chappell. Other recent lectures and publications include “Hugh Orr’s Orpiment Hue: Paint Analysis Discoveries at the George Reid House” *Traditional Paint Journal* (August 2021); “Orpiment in Colonial Williamsburg: Challenges in the Analysis of Yellow Arsenic Sulfides in Historic Housepaints” (*Microscopy & Microanalysis* 2021 Conference); and “Scheele’s Green: The Original Arsenical Green” for the (2022 Inaugural Bibliotoxicology Working Group Symposium). She has lectured on the topic of paint microscopy for Atlas Obscura, the Buffalo College Art Conservation program, and International Academic Projects.

Chrome Yellow: American Mineral, American Fancy

The early history of chrome yellow, the brilliant yellow lead chromate pigment that became one of the most important colorants of the nineteenth century, is uncertain. Dates in published references vary, ranging throughout the first decades of that century, clarifying its use was initially limited due to a scarcity of raw materials. Recent archival research sheds new light on the history of chrome yellow pigment, made from chromium ores in the Baltimore-Philadelphia region as early as the first decade of the nineteenth century. Supporting materials analysis illustrates chrome yellow’s influence on the arts, especially painted objects in the distinctive “American Fancy” style (ca.1790-1840) which utilized bright yellow accents in its ornamentation.

New evidence shows that American chrome yellow first appeared as a short-lived collaboration between Rubens Peale (1784-1865) and the French mineralogist Silvain Godon (ca.1774-1840), who discovered sources of “chromate of Iron” during mineralogical excursions in the Baltimore Philadelphia region. Their 1809 business venture to establish a “Manufactory of Chrome Colours” failed dramatically, leaving Silvain in debtor’s prison while Rubens commenced the management of the museum owned by his father, the painter and naturalist Charles Willson Peale. The prohibitive cost of chrome yellow in the two decades that followed resulted in continued dependence on traditional inorganic yellows such as orpiment and Patent yellow. In 1827, Isaac Tyson (1792-1861), a Quaker with a passion for mineralogy, re-discovered significant chromium ores in the Baltimore-Philadelphia area. Tyson’s Baltimore Chrome-Works held a global monopoly on chromium pigments until the mid-nineteenth century, industrializing the vivid yellow known then as “Baltimore Chrome Yellow.” Technical

analysis of Fancy-painted objects from this period elucidates chrome yellow's early history of use and how this pigment, synthesized from an American mineral, found its place in the painted finishes of the New Republic and eventually, the world.

- **Manon van der Mullen** studied Art History at Utrecht University. After her position at the print room of the Austrian Museum of Applied Arts (MAK) in Vienna, she worked at the Rijksmuseum between 2012 and 2022, holding various positions including junior curator of 18th and 19th-century prints. Currently, she is head of collections and research at Dordrecht Museum.

Colour Printing Ink Matters: Exploring Colour and Chromatic Materialises in Printing Inks in the Late 18th and Early 19th Century

Authors: Victor Gonzalez, Manon van der Mullen, Chiara Palandri, Elizabeth Savage, Dionysia Christoforou

Despite being among the most ubiquitous heritage materials, printing inks are still poorly understood today. This collaborative paper presents the initial results of technical analysis into colour printing inks from the late 18th and early 19th centuries, before the end of the 'handpress period' c.1830, and before the development of synthetic chemistry and the industrialisation of printing ink manufacture and print technologies transformed the production of colour printing inks.

This presentation brings together the results of the first major research projects involving the technical analyses of colour printing inks from this period, the first half of the long 19th century and its immediate precedents. First, we call for the understanding of historical inkfilms as material objects and explore the history of colour printing inks and inking during this time, and for colour print research of this period to move beyond the conventional major European capital cities. Then, we present the analysis of rare records of recipes and ingredients for three major producers' colour printing inks and their comparison to the materials that they actually used in their prints, including Jacob Christoff le Blon (1667–1741) from the 1720s and Jacques Fabien Gautier-Dagoty (1710–81) and his son Jean-Baptiste André from the 1740s–50s. Next, we present the first detailed analyses of the series *Lorentzen-stikk* (1789–c.1815), by the major Scandinavian colour printmakers of this period, and consider how Erik Pauelsen's (1749–90) development of colour intaglio colour printing inks, under the patronage from the King of Denmark and Norway, could have led to his death.

We conclude with a call to action for the further analysis of pre-industrial European printing inks of the late handpress period, c.1700–1830, including for artworks on paper, books, textiles, pottery, wallpapers, decorative papers, and the reconsideration of colour printing inks as ‘colour matters’. This research bridges the gap between artistic, technical, and optical experimentation with the ingredients, recipes, and techniques for producing colour printing inks, and it offers new methodologies for understanding printing inks based on archival research and instrumental analysis.

- **Charlotte Nicklas** is Senior Lecturer in History of Art and Design and is Course Leader of the MA History of Design and Material Culture at the University of Brighton. She co-edited (with Annebella Pollen) *Dress History: New Directions in Theory and Practice* (Bloomsbury Academic, 2015). She has published articles in *Costume* and the *Journal of Design History* and recently served as book reviews editor for *Costume*. In her PhD thesis, she examined cultural understandings of colour and textile dyes in the mid nineteenth century and is currently transforming this work into a book. Nicklas also has a longstanding interest in the textual representation of dress in various forms of nineteenth- and twentieth century literature, including fiction and history.

Cabbage Green, Tyrian Purple, and Eugénie Blue: Colour, Language, and Theory in Mid-Nineteenth Century Women's Fashion

Fashionable women’s dress in the mid-nineteenth century provided visible evidence of contemporary dyeing developments. This paper will examine the sophisticated language used in women’s magazines to describe this rainbow of colours. This language revealed the cultural concerns of the editors, writers, and readers involved in these periodicals, while also helping to construct this community.

Drawing primarily on English-language periodicals aimed at middle-class women, this paper will discuss how colours were named, described, and qualified. Contemporary colour theory, especially that of Michel-Eugène Chevreul, exerted a strong influence on writing about colour, with authors emphasizing that readers should learn principles such as contrast and harmony of colours. This research adds to the growing scholarship on nineteenth-century understandings of colour theory and consumption (especially Blaszczyk 2012 and Kalba 2018), focusing specifically on textual, visual and material representations of fashion.

The fashionable colour vocabulary drew on a wide range of sources. Natural referents were most common, with fashion reports mentioning colours such as ‘cabbage green’ and ‘*ponceau*

[poppy]’, a nod to the fashionable supremacy of the French language. William Perkin initially marketed aniline purple as ‘Tyrian purple’, evoking the valuable dye of antiquity. Notable contemporary figures, such as the Empress Eugénie, inspired colour names too. New terms, such as ‘mauve’, ‘magenta’, ‘azuline’ and ‘viline’, also entered fashionable discussions of colour, highlighting the novelty of synthetic textile dyes.

By defining, repeating, and comparing these terms, fashion writers helped educate their readers in this language during a time of dramatic colour developments. Authors used this language to construct fashionability and good taste for their community of readers, but they also acknowledged the difficulties in describing colour and the temptation to take fashionable colour terms too seriously. Ultimately, the creative lexicon of words and references expressed nuanced appreciation and genuine pleasure in the great variety of colours.

- **Christine Olson** (PhD, Yale University) is a Visiting Professor of Art History at Wheaton College in Norton, Massachusetts, where she teaches topics in modern art and visual culture. Her research draws on an interdisciplinary background in European and Islamic art history, American material culture, and museum studies to examine the appropriation of global and historical ornament within nineteenth-century design. She is currently working to revise her dissertation into a book titled *Ornament and the Other: Owen Jones and the Sources of Modern Design*. Prior to her doctoral work, Christine was the Tiffany & Co. Curatorial Intern in American Decorative Arts at the Metropolitan Museum of Art (New York). She holds an M.A. in Humanities and Social Thought and Advanced Certificate in Museum Studies from New York University, and a B.A. from Oberlin College (Oberlin, Ohio).

Art History and the Modern Surface: Painted Plaster at the Crystal Palace

The Fine Art Courts at the Crystal Palace at Sydenham (opened 1854) represent a well-documented episode in Victorian debates about historical polychromy. Designed by Owen Jones and Matthew Digby Wyatt, the Courts mapped a taxonomic history of art in a series of ten pavilions representing periods from antiquity to early modernity. Consisting of vividly colored plaster replicas of monuments and works of sculpture, the Fine Art Courts illustrated widely circulating (if controversial) period understandings about historical polychromy. Proponents lauded the displays as an innovation in public art historical education; detractors criticized them on the basis of both historical accuracy and taste, with John Ruskin famously decrying them as tawdry simulacra of the great works of the past.

While much of the scholarship on the Fine Art Courts has focused on the discourses of historical polychromy they engendered, this paper takes a different approach by re-examining the flamboyant surfaces at Sydenham from the perspective of their design and materiality. Focusing on how they were created—and what their physical and epistemological makeup tells us about the role of color in the construction of Victorian art history—I approach the painted plaster of the Fine Art Courts as a key interface between past and present. My analysis begins with the recognition that the historicizing displays were produced through categorically modern materials and methods. Foregrounding the tension between the underlying modularity of the rectangular structures and the disparate treatment of their polychromed surfaces, I demonstrate how color functioned as an index of art historical difference and thereby mediated the Courts' taxonomy of styles. From here, I argue that by locating signs of difference on the colored and patterned surface, Jones and Wyatt interpolated Victorian art history with the racializing project of colonial ethnology and extractive logics of imperialism and industrial capitalism.

- **Vanessa Otero** is a Researcher at the Department of Conservation and Restoration and LAQV-REQUIMTE R&D unit of the NOVA University of Lisbon. Her research crosses the disciplinary boundaries of technical art history and conservation science, enhancing knowledge of artists' materials by combining the study of their historical production, colour stability and analytical characterisation, aiming to contribute to better conservation and authentication procedures. Currently, she is the Principal Investigator of REDiscover, a project dedicated to an integrated study of the manufacture and stability of madder reds towards their preservation in artworks.

Exploring the Winsor & Newton 19th century Archive Database to support cultural heritage material studies

Authors : Vanessa Otero, Raquel Marques, Mark Clarke, Leslie Carlyle, Márcia Vilarigues & Maria J. Melo

Winsor & Newton (W&N) was one of the leading colourmen of the 19th century worldwide, having supplied important painters such as J. W. Turner (1775-1851) and John Constable (1776-1837). It was founded in 1832 by William Winsor (1804-1865), a colour chemist and artist, and Henry Charles Newton (1805-1882), a professional artist. Since the beginning, the company was committed to developing and improving the quality of artists' materials, a task they assumed as their responsibility as artists' colourmen [1].

The W&N 19th century archive is a unique primary documentary source covering handwritten instructions, workshop notes on diverse artists' materials and shop floor accounts. It is one of the most comprehensive historical archives of detailed instructions for the commercial production of art materials. Since 2006, it has been available as a page-image database. It comprises a summary index linked to digitalised page-images of 85 manuscript books (corresponding to 16.648 page-images) and a digital collection of 47 W&N 19th-century trade and retail catalogues [2].

The investigation developed by the authors has proven the exceptional value of the W&N 19th Century Archive Database in providing a unique insight into the company's choices and workshop practices. Significant discoveries have been made in understanding 19th-century pigment manufacture for yellow chromate, cadmium yellow, cochineal based colourants and bitumen brown oil paint. In addition, we have also contributed to advances in their characterisation as well as the study of their stability in heritage objects [3,4].

This oral presentation will offer an overview of the main achievements to date and discuss future perspectives for the W&N 19th Century Archive Database, including its nomination to the UNESCO Memory of the World Register. It is fundamental to share this unique source of information to the world's culture.

- **Chiara Palandri** has worked as a senior book and paper conservator at the Conservation Department of the National Library of Norway. From 2004 to 2015, she taught the conservation and restoration of parchment and paper-based materials at the Academy of Fine Arts of Brera in Milan, Italy. In 2015, she was appointed Professor in Conservation of Cultural Heritage, leading the Paper, Books, Photographs, Film, and Digital Media Conservation Department, also at Brera. She has been supervisor for numerous postgraduate theses in conservation. She is Vice-President of the International Association of Paper and Book Conservators (IADA), a Fellow of the International Institute for Conservation of Historic and Artistic Works (IIC), and an active member in international research projects in the field of conservation and the history of techniques and materials.
- **Lucia Pereira Pardo** is a heritage scientist and “Ramón y Cajal” researcher at the Institute for Heritage Sciences (INCIPIT) of the Spanish National Research Council (CSIC), where she develops research about material culture, particularly painted objects,

textiles and archival heritage, by means of multiple non-invasive analytical techniques. Before joining the INCIPIT in January 2023, she was a Senior Conservation Scientist at The National Archives (2019-2022), where she developed projects about the materiality of textiles, early maps and illuminated manuscripts. Between 2015 and 2019 she was a conservation scientist at Historic Royal Palaces, a postdoctoral A.W. Mellon fellow at the Scientific Research department at the British Museum and a ZSK/MINIARE fellow at the Fitzwilliam Museum (University of Cambridge). With a background in chemistry, material analysis and data science as well as in art history, she completed her PhD in Heritage Science at the University of Santiago de Compostela in 2015, after specialising in the analysis of pigments and dyes in the Laboratories of the Spanish Institute for Cultural Heritage in Madrid (IPCE) in 2009.

- **John Plunkett** is Associate Professor in the Department of English at the University of Exeter; his research focuses on the visual shows and media that so fascinated audiences during the nineteenth century. His books include *Queen Victoria – First Media Monarch* (2003), *Victorian Print Media – A Reader* (2005), co-edited with Andrew King, and *Popular Exhibitions, Science and Showmanship 1820-1914*, co-edited with Joe Kember and Jill Sullivan, as well as articles on panoramas, dioramas, stereoscopy and peepshows. His current project is a co-authored book with Joe Kember, *Picturegoing: Visual Shows 1800-1924*, based on the results of large AHRC grant, which will detail the exhibition networks of nineteenth-century visual shows across the south west of the UK.

Depths of Colour: Stereoscopy and the Achromatic Eye

3D cinema usually requires viewers to wear glasses with red and green lenses. The origins of this technology stem from nineteenth-century research on the physiology of vision. Experiments on the perception of moving-images, spatial depth and colour went hand-in-hand, resulting in popular optical devices like the phenakistoscope, stereoscope and colour top. My paper will detail the scientific investigations that linked colour and stereoscopy, and how this resulted in variety of 3D devices and prints. Distinguished figures such Charles Wheatstone, David Brewster and Wilhelm Dove all investigated the achromatic nature of the eye as part of their research on binocular vision. Brewster, for example, began work on a chromatic stereoscope in 1848, while French scientist Joseph d'Almeida attempted to create projected 3D images in 1858, using two magic lanterns, one with a red filter and

one a green filter, projecting superimposed images. Experiments on the way colour affected depth-perception were also often included in books of scientific recreation such as *Parlour Magic* (1838).

In addition to the use of coloured lenses/filters on optical devices, 3D effects were produced by colouring stereographs and by the invention of anaglyph printing. Early nineteenth century transparent *vue d'optiques* and dioramic prints were often hand coloured, either on recto or verso; red and green tints were heavily used to augment depth perception, suggesting an established knowledge of the phenomenology of colour. Transparent issue stereographs continued this practice through the 1850s-1880s; 1891 saw the production of the first printed anaglyph by Louis Ducos du Haroun. This process consisted of printing the two negatives which form a stereoscopic photograph on to the same paper, one in blue (or green), one in red. My paper will conclude by demonstrating the numerous children's books, postcard and annuals that included anaglyphs .

- **Emeline Pouyet** is the Associate Scientist at the Center for Scientific Studies in the Arts at the University of Northwestern, Chicago, where she coordinates the external project program that supports worldwide cultural institutions and scientists that do not have access to a state-of-the-art scientific research facility. Her role aims at providing scientific support for the investigation of art collections, and at developing new technology to study and conserve artistic materials. She completed her PhD in Physics, in 2015 at the ID21 beamline at the European Synchrotron Radiation Facility in Grenoble, France. Her activities focus on using visible-, infrared- and X ray-based techniques to achieve molecular, elemental, and structural characterization of complex work of art at multiple scales.

Color in Neo-Impressionism painting: a comprehensive chemical and optical study

Authors: E. Pouyet, A. Malmert

The late nineteenth and early twentieth centuries were marked by tremendous innovations in art and science. From one hand with the rapid rise of the chemical industry, numerous new inorganic and organic pigments were developed and marketed as alternatives to well-established traditional pigments. On the other hand, development of spectrophotometry and the flourishing of numerous treatises on light/matter interactions, were soon made available to artists in their search of capturing the ephemeral light.

Neo-impressionist artists embraced these scientific developments and went so far as to describe themselves as “scientific colorists”. Paul Signac (1863-1935), co-founder of the Neo-Impressionism movement, in details his treatise *D’Eugène Delacroix au Néo-impressionnisme* (1899): “the Neo-Impressionist does not dot, he divides. Though, dividing is: Ensuring all of the benefits from brightness, coloring, and harmony by means of: 1° The optical mixture of solely pure pigments (all the tints of the prism and all their tones); 2° The separation of the different elements (local color, color of the lighting, their interactions, etc.); 3° The equilibrium between these elements and their proportions (according to the laws of contrast, of gradation, and of irradiation) “

Equipped with a new prismatic palette and new scientific theories, neo-impressionist artists were able to exploit color mixtures, and by using a variety of painting techniques, they created new factures.

In order to bring a renewed knowledge of these pictorial practices, the proposed study combines i) non-invasive analyzes of P. Signac paintings and contemporaneous M.E. Chevreul’s color circles (X-ray fluorescence, visible hyperspectral reflectance imaging spectroscopy), with ii) a study of neo-impressionists and contemporaneous scientific texts and guidelines regarding color theory and its application in painting. The multi- technique approach developed allow to reconstruct the creative process of the neo-impressionist artist and represents a unique opportunity to determine through analytical studies the links between 19th century literature on color theory and its application by contemporaneous artists.

- **Fraser Riddell** is Assistant Professor in English and Medical Humanities at Durham University. His research focusses on embodiment and the senses in late-nineteenth century literature and culture. He has published widely on the body and the arts in Decadent literature, including in *The Oxford Handbook of Decadence*, *Journal of Victorian Culture and Victorian Literature and Culture*. Recent work on Vernon Lee has appeared in *Volupté* and *Studies in Walter Pater and Aestheticism*. His first monograph, *Music and the Queer Body in English Literature at the Fin de Siècle*, was published by Cambridge University Press in 2022. At Durham University’s Institute for Medical Humanities, he is the co-lead of the Wellcome ‘Affective Experience Lab’, which investigates the significance of sensory and emotional experiences in cultural understandings of health and illness.

Staining the Histological Imagination: Decadent illustration and Alastair's Colours of Consciousness

The first part of the paper explores the significance of colour in advances in nineteenth-century histology. It focusses in particular on the place of new staining techniques which transformed the field of neuroscience. The development by Camillo Golgi (1843–1926) and Santiago Ramón y Cajal (1852–1934) of the ‘reazione nera’ (black reaction), for instance, allowed for neurons and glia to become visible under the microscope for the first time. This fundamentally changed scientific understandings of the structure of the nervous system. In the decades that followed, histological stains and reagents afforded a new visual language for the material basis of consciousness itself: the blues of toluidine and methylene; the purples of silver nitrate and silver carbonate; or the reds of carmine and erythrosine.

As work by Javier DeFilipe (2010, 2018) has shown, Cajal was instantly alert to the aesthetic dimension of these new visual worlds, comparing them to ‘designs in Chinese ink on transparent Japanese paper’. Scholars have extensively explored the transformational significance of the microscope on nineteenth-century literary and artistic culture (Otis 1999; Armstrong 2002). Yet little work has registered the importance of developments in histology for our understanding of colour. In the second part of my paper, I argue for the histological stain as a model for Decadent illustration, examining works by the German artist, dancer and poet ‘Alastair’ (Hans Henning Voigt, 1887–1969). Alastair’s perspectival flatness, fascination with distorted organic patterns, and use of a limited range of colours (white, black and red/ blue) evokes the forms of Cajal’s microscopic ‘neuronal forests’. In his illustrations for Frank Wedekind’s *Erdgeist* (1895) and Walter Pater’s ‘Sebastian von Storck’ (1886), Alastair looks specifically to the staining techniques of neuropathology—such as Max Bielschowsky’s silver stain for neurofibril tangles—to suggest a material basis for his characters’ apparent mental abnormalities.

- **Alessandra Ronetti** holds a PhD in Art history, awarded with honours by University Paris 1 Panthéon-Sorbonne and Scuola Normale Superiore (Pisa) in 2019. She is currently Research Fellow at Sorbonne University and Conservatoire des arts et metiers (CNAM, Paris) for the ERC Project Chromotope (in collaboration with Oxford University). She also teaches at Sorbonne Nouvelle University in Paris. She was Temporary Lecturer and Research Fellow at University Paris 1 (2017-2020), Visiting Researcher and Adjunct Professor at New York University (2016). Her dissertation *Chromomentalism. Colour Psychology and Visual Culture in France (1870-1914)*

focused on the impact of nineteenth-century psychological theories of colour on visual culture, including visual and performing arts, popular imagery and optical devices. She has participated in international conferences on art history, colour and visual studies, and has published several articles in peer-reviewed journals.

Crazy for Colour! Dazzling Colours and Madness in Fin-de-siècle Visual Culture My talk addresses interdisciplinary questions on colour, visual culture and fashion raised by history of psychology and medicine, colour studies, art history and sensory studies. The 19th century chromatic revolution led to a cultural obsession for bright colours all around Europe, and then in America, and created new consumer desires of colour in fashion, interior decoration and many other social experiences, changing the landscape of visual culture. How the spread of these new “showy” colours – as the French philosopher Hippolyte Taine referred to them in 1872 – influenced the perception of colour and affect the mental and bodily capacities of the modern beholder? The fields of psychophysiology and experimental psychology, which emerged around the same time of the chromatic revolution, tried to answer this question by testing not only colour perception, but also the *hysteria* or madness (in psychiatric terms) derived from the exposure to the new coloured sensorium. Towards the end of the century, psychologists and psychiatrists use the same chemical colours – produced by the dye industry that provided colours for the fashion world – to test colour perception in laboratories. They also study the emerging pathologies related to colour in the consumer culture, especially how these new artificial bright colours, in connexion with the glowing power of electrical lighting, are responsible for new forms of *kleptomania* affecting women in Department Stores. Too many colour stimuli can produce a strong nervous and bodily reaction and induce pathologies, but colour can also be a form of cure of that madness and neurotic reaction, thanks to its supposed therapeutic effect. I argue that chromotherapy, a widespread treatment since 1870s, – involving immersive coloured atmospheres created by colour-light baths, painted walls, clothes –, became a fashionable practice in fin-de-siècle culture as a way to organize and influence the psychological reactions (and the derived pathologies) generated by the new colour sensorium. This led to a new epistemological interpretation of colour as an embodied and multisensory experience. The paper will show the many faces of 19th century *chromomania*, taking into account examples from different media (painting, photography, popular imagery, dresses, fashion news reels).

- **Edith Sandström** is a Postdoctoral Researcher at the Maastricht Multimodal Molecular Imaging Institute (M4i) at Maastricht University, developing novel mass spectrometry instrumentation for imaging studies. She obtained her PhD from the University of Edinburgh, which focussed on the development of micro- and non-invasive analytical methods for the study of dyes in historical textiles from the collections at National Museums Scotland. She has a keen interest in developing analytical chemistry techniques and applying them in a heritage science setting.

The Dawn of Synthetic Dyes in England and Scotland. Analysis of Textile Samples in the Board of Trade Design Registers of 1856-1859

Authors: Lucia Pereira Pardo/Edith Sandstroem, Lore Troalen

The Board of Trade (BT) Design Registers are a vast collection of more than 10,000 volumes preserved at The National Archives, which contain almost three million British patterns, designs, trademarks and material samples, as submitted by the manufacturing companies to the Registry to protect their patents between 1839 and 1991. The volumes are organised by material and, in those dedicated to textiles, one can find thousands of fragments of cloth, trimmings and lace, arranged chronologically and providing accurate information about their date and place of origin, which makes this collection an invaluable resource for industrial history research.

In this project we addressed two research questions: 1) Can the technical analysis of well provenanced textiles from 1857-59 shed light on the introduction of synthetic dyes in the British textile manufacturing industry? 2) How far can we go in the identification of dyes using a non-invasive approach?

24 textiles registered in the Board of Trade Volume covering the period 1856-1859, were selected for analysis, aiming to investigate a wide range of colours (red, blue, yellow, purple, green and pink) and a representation of different textile manufacturing centres across Britain (Glasgow, Manchester, Nottingham and London).

The textiles were analysed non-invasively by Multispectral Imaging (MSI), Fibre Optics Reflectance Spectroscopy (FORS) in the VIS and SWIR range and Micro Raman spectroscopy (MRS) at 785 nm. Non-invasive SERS at 532 nm was also attempted by testing dry-state substrates and gel-assisted micro extraction directly on the fabrics. The non-invasive results were compared with those by Ultra High Performance Liquid Chromatography -Photo Diode Array (UHPLC-PDA) on extracts from 27 thread samples.

The analysis showed that most of the samples were dyed with a mixture of natural and synthetic dyes, with the exception of four cases dyed with natural dyes only, and five cases dyed exclusively with synthetic dyes, all of the latter manufactured in 1859 across the country. The wide variety of synthetic dyestuffs detected in commercial samples dated so closely after the invention of the dyes highlight the boom of the industry and the successful marketability of these new colourants across the country. Methodologically, while some of the non-invasive analysis was able to narrow down the type of dye in some cases and constitutes a helpful strategy for planning the sampling, the detailed information on complex dye mixtures provided by UHPLC was thought to justify taking a limited number of minute samples from the textiles.

- **Marie-Anne Sarda** is senior heritage curator at the French National Institute of Art History in Paris. After studying art history and modern literature at Paris IV-Sorbonne University and at the Institute of Fine Arts of New York (Fulbright Program), Marie-Anne Sarda began her career as a museum curator in 1988. Her successive positions in charge of the Mallarmé Museum, the Royal Monastery of Brou and the General Inventory of Cultural Heritage in the Centre-Val de Loire region, have confronted her with very different artefacts. She indeed published on the restoration of architecture of the late Middle Ages, painting and decorative arts of the 18th and 19th centuries, historical textiles, illustrated books by artists and contemporary stained glass. Curator of numerous exhibitions, her main fields of research are the collaboration between artists and craftsmen as well as the dialogue between contemporary art and heritage. Committed to the study of material culture, Marie-Anne Sarda has undertaken since 2017 an interdisciplinary research program on the history of dyestuffs. Combining industrial and artistic archives, object-based laboratory analysis and technical experimentation with dyers, this project intends to document the shift from natural to synthetic components in dyeing during the second half of the 19th century.

Between heritage, militaria and concept: the Magenta case

Symbolic of the strong mutation that shook the materiality of color in the middle of the 19th century, the British discovery by Perkin in 1856 of “Tyrian purple”, also known as “aniline purple” or “mauve”, was soon challenged by the French invention by Verguin in 1858 of “fuchsine”, also called “aniline red” or “rosaniline”. Over a decade, these two new colours brought about twenty or so British and French patents for synthetic reds and violets

due to different chemists: Tabourin-Franc (1858); Monnet-Dury, Renard Frères, E. Franc, Kay, Greville Williams, Beale-Kirkham, Price, Gerber-Keller (1859); Depouilly-Lauth, Nicholson, Girard-de Laire, Guigon (1860); Nicholson (1862); Hofmann, Persoz (1863); de Claubry (1864); Monnet, Lauth (1865); Girard-de Laire (1867).

Contrary to the legend of mauveine, these crimson reds and violets were not totally new: from the 1840s, the dyeing and printing manufacturers multiplied lilac, violet and purple textiles. As a matter of fact, improvements in dyes during the 1850s such as French purple and murexide anticipated Perkin's work, thus allowing the synthetic dyes to establish their notoriety on a booming fashion within the wardrobe of European women. Finally, whereas the initial name of "Tyrian purple" given by Perkin on a historical basis had been replaced by the French appellation "mauve", which purple or violet is commonly referred to in the press as "magenta", the name of a military victory of Napoléon III (1859)?

Starting around 1850, this paper is based upon patents, contemporary publications and textile examples (dyers and sample books, garment pieces). Apart from presenting the aniline violets and reds from 1856 to 1867, this Magenta case study will also introduce the patents relaunching fuchsine in the 1890s.

- **Elizabeth Savage** FSA FRHistS is Senior Lecturer in Book History and Communications, Institute of English Studies, School of Advanced Study, University of London. Her research into pre-industrial European printing techniques across text and image, especially for colour and in the 15th–16th centuries, has won awards including the Schulman and Bullard Article Prize. Her books include *Printing Colour 1400–1700* and *Early Colour Printing: German Renaissance Woodcuts* at the British Museum; *Printing Colour 1700–1830* is forthcoming. She regularly curates and contributes to exhibitions, including at the British Museum and Musée du Louvre. She teaches at London Rare Books School.
- **Giulia Simonini** is a graduate conservator, art historian, and Ph.D. in the history of science with a thesis on 18th-century European colour charts and their applications. She currently works as a post-doc in the research project *Dimensions of techne* in the fine arts at the Technische Universität Berlin and teaches at the Konstanz University.

The Hayters and the Controversy on Colour

The painting *A Controversy on Colour or Portraits of Charles Hayter and Three Young Artists* (1823) by John Hayter (1800–1895) captured the interest that his father, the miniature painter Charles Hayter (1761-1835) had in modern colour theories. The painting depicts Hayter senior holding a prism in his hands demonstrating the laws of colour to Edward Landseer, William Mulready, and Clarkson Stanfield, who is pinpointing the page of a manuscript displaying a colour scheme.

Charles Hayter had published that very scheme at first in black and white (1813) and later in colour in *A New Practical Treatise on the Three Primitive Colours* (1826). He called it “the painter’s compass”. His son George, also a painter, published a less-known “Diagram of Colours” in *Hortus Ericæus Woburnensis* (1825). Both schemes look rather similar and follow the trichromatic theory of colour mixing. This paper will delve into the context in which the Hayters’ developed their colour schemes, namely few years after the appearance of Goethe’s *Farbenlehre* (1810), James Sowerby’s *A New Elucidation of Colours* (1809) and of the second edition of Moses Harris’s *The Natural System of Colours* (1811), thereby trying to explain the controversy highlighted in the title. The paper will also explore their utility, goals, and intersections with previous and contemporary discourses on colour theory.

- **Kay Simpson** is a PhD student in the Department of History and Philosophy of Science at the University of Cambridge. She is interested in intersecting histories of art, medicine and modernity, and her doctoral work examines ideas and practices of colour as therapeutic in Britain in the decades around 1900. This project is generously funded by an Open-Oxford-Cambridge AHRC DTP studentship. She previously completed an MA in Art History at the Warburg Institute (2018-19) and an MPhil in History and Philosophy of Science at Cambridge (2020-21).

Colour and Convalescence in the Victorian Hospital

Victorian hospital interiors underwent a chromatic transformation in the second half of the nineteenth century: ‘whitewash’, the standard of sanitary ward design since the 1831-32 cholera epidemic, gave way to a more vibrant palette. By the 1860s diverse critics were targeting the practice of lime-washing the walls and decrying the adverse and even pathogenic effect of this ‘cheerless,’ ‘monotonous’ tint on patients. This ranged from Florence Nightingale’s call for a ‘brilliancy of colour’ to aid the mind and body in recovery, to the soft blue-green interiors of Henry Burdett’s 1880s ‘Hospital Homes’ scheme. Agnes Garrett, designer of the widely-publicised citrine and peacock-blue scheme for the New Women’s Hospital in Euston

(1892), encapsulated this new kind of medicalised understanding of colour when she wrote that ‘decorators may be compared to doctors’. Historians have addressed transformations in the Victorian hospital interior in light of the sanitary reform movement and the domestication of ward spaces [Adams 2008; Kisacky 2017]. However, the chromatic dimensions have yet to be fully developed both as an extension of these histories, and also as part of a wider ‘chromotherapeutic’ culture of Victorian Britain that elevated the role of colour in healing through discourses on perception, nervous susceptibility to the environment and the industrial transformation of society. By drawing out how colour developed a particular moral, medical and political significance in hospital design-- as a contested site of expertise between designer and doctor, a reformatory influence on behaviour and as an aid to convalescence— this paper will stake a wider claim for the importance of colour as a conceptual category in the history of medicine, as well as the relevance of medical histories of space, self and health to understanding the materiality of nineteenth-century colour.

- **Daria Sorokina** is a doctoral student at the School of Literature, Arts, and Social Sciences 540 at École Normale Supérieure in Paris. Daria holds a Master's degree, in the interdisciplinary program “COOP Design Research”, organized jointly by the Foundation Bauhaus Dessau, Humboldt University Berlin, and Hochschule Anhalt. Daria received her Bachelor's degree in History of Art from the Russian State University for the Humanities in Moscow. Her research interests focus on international modernism in particular on art pedagogy, specifically on how colour was taught in art schools such as the Bauhaus in Germany and the VKhUTEMAS — Higher Art and Technical Workshops in Moscow.

Optophonic piano of Wladimir Baranoff-Rossine

The name of artist and inventor Wladimir Baranoff-Rossine cannot be called “forgotten” but can definitely be classified among those with enormous potential who, for a long time, remained in the shadow of famous colleagues and friends. The artist's life story sounds like the script for a great movie. It starts in a small Jewish town in Ukraine, goes to Kiev, Odessa, Moscow, Oslo, and Paris, and ends at the Auschwitz concentration camp. Throughout his life, Baranoff-Rossine was always eager to learn new things, conduct studies, generate new ideas, and break free from established patterns, particularly when it came to light and color.

In Kiev in 1908, Wladimir Baranoff-Rossine became interested in the relationship between painting and music while arranging an exhibition for the “Zveno” group, which aspired to

synthesise all the arts by bringing together painters, musicians, and sculptors. He began studying Chevreul's color theory and experimenting with color perception as early as 1909. In Paris in 1910, he met the couple Sonia and Robert Delaunay, who had a significant influence on his views on new painting. Although Orphism had a significant influence on Wladimir, he also created some of his own color-related ideas and innovations. In the early 1910s, Baranov-Rossine came up with the idea of an optophonic piano, which would be an instrument that could recreate the feeling of changing light and color. This would take light and color beyond the limits of fine art and into time and space. He discussed the concept with Skryabin and Kandinsky. He subsequently brought it to life, patented it, established an “optophonic academy,” and created a variety of other color- and light-related instruments and technologies. His innovations had the greatest impact on the development of color and light music in Russia. This presentation will discuss the origins of Wladimir Baranoff Rossine's invention of the “optophonic piano,” essentially a mechanical device for composing and combining patterns and colors, in the “long” nineteenth century and the subsequent development of his ideas in different countries in the twentieth century. The novelty of this study lies in both using previously unknown documents and putting known facts into a new context.

- **Marte Stinis** is a research associate with the University of York and the Netherlands Institute for Art History, and recently completed a postdoctoral fellowship with the Paul Mellon Centre. She holds a PhD in History of Art from the University of York, in which she researched the relationship between painting and music in the nineteenth century. She has published widely on the intermedial relationships between the two arts, including articles on D.G. Rossetti, John Singer Sargent, and James McNeill Whistler. Marte frequently speaks at international conferences and is co-founder of an international, interdisciplinary research group entitled TFISM (Transition: Forum for Interdisciplinary Studies into Modernity) which hosts bi-annual conferences investigating unconventional and decolonial narratives in the construction of modernity in the arts and humanities.

Colour for its own sake: The search for colour-music associations in Victorian Aestheticism

How do we talk about colour? What language do we use to describe the materiality, the effect, and the agency of something as elusive as colour? And how can we explore colour for its own sake, both within painting and within the critical language used to describe it? These were

questions both English artists and art critics struggled with in the second half of the nineteenth century. Bringing together social history, art history, aesthetics, and colour theory, this paper will focus on the avant-garde movement Victorian Aestheticism and how, under its credo of ‘art for art’s sake’, its artists dealt with colour.

Following a re-appreciation of sixteenth-century Venetian painting, many artists in the 1860s were keen to explore deeper and richer colours in their own practice, independent of subject matter. But this focus on colour left critics puzzled. How do you describe the effects of colour on the viewer? One answer to this query lay in the metaphorical analogy with music. Using an interdisciplinary and intermedial lens, this paper will take a closer look at the colour-music associations attributed to Victorian Aesthetic works by their critics, and how musical terminology was used to describe the experience of colour. I will argue that Victorian Aesthetic artists approached colour for its own sake through this lens of music. Among the artists I discuss are James McNeill Whistler, Frederic Leighton, and Albert Moore, who all had particular formulas for their production of colour and whose work was consistently approached in the critical press with phrases like ‘harmony in colour’ or ‘symphony in colour’. By reflecting on their use of colour – as materialistically tied to capitalist production and ideologically to imperialist worldviews – and as mediated through music, we can better understand contemporary chromatic ideas in their aesthetic relation to music.

- **Joyce Townsend** is senior conservation scientist at Tate, London, UK. She has carried out research for over 30 years on the identification and deterioration of artists’ materials and has published on the interpretation of artists’ techniques in both oil and watercolour, for 19th-century British and earlier 20th-century international art in particular. She is co-author of *The Tate Watercolour Manual* (Tate 2014) and author of *How Turner Painted: Materials and Techniques* (Thames and Hudson, 2019). Recently, she has contributed technical studies to online catalogues on British artists of the Tudor Stuart period, Whistler, Modigliani and Picabia. She has published widely for a range of audiences as well as editing numerous technical art history, conservation, and heritage science conference proceedings. She is currently an honorary professor in the School of Culture and Creative Arts at the University of Glasgow, UK.

Painting slate colour, purple and pink across the long nineteenth century

There were no useful artists' pigments to use in their pure form for slate or purple tones in the earlier 19th century. Artists working in both watercolour and oil mixed these shades from blue, red and pink, utilising their long experience with the mixed greens that they used for landscapes and foliage, in default of pure green pigments in the same decades. Even when purple and magenta fabric became very fashionable towards the end of the 1850s following the invention in Britain of Perkin's mauve and other synthetic dyes, British artists including portraitists often continued to use mixtures to create a range of subtle tones at the redder end of the spectrum, with only gradual adoption of the wider range of red and purple shades provided by new pigments as the century progressed. It was radical artists with connections to France who were the earlier adopters of the newest synthetic dyes. Artists' reliance on personal networks for knowledge of materials, leading to a paucity of written records of the materials they used, make it imperative to seek information on colour use through technical analysis of their art. Examples illustrating trends in the use of colours, based on materials analysis of both oils and watercolour in the Tate collections, and publications on technical studies for contemporary artists working in France, will be given. Examples of brilliant colours achieved by traditional mixing, and examples of severe colour loss resulting from the employment of new pigments, will be presented.

- **Véronique Treluyer** is a restorer expert in fire arts: ceramics, enamels and glass. Graduated from Ecole du Louvre and Institut National du Patrimoine, she holds a master of Preventive Conservation of Paris I Panthéon Sorbonne. She has worked as independent restorer in the last 30 years with prestigious institutions such as the musée d'Orsay, musée du Louvre (Department Islamic of Arts and of Objects of Art), Bibliothèque Nationale de France (BNF, cabinet des Médailles et Antiques) musée national de la Renaissance (Ecouen), musée national du Moyen Age (Cluny). With Orsay Museum she conducted several studies and interventions on nineteenth century production including as example work from Dalpayrat (ceramics), Gallé (glasses) and Henry Cros (glass paste sculpture, wax painting). She has a strong knowledge regarding materials and practices of this period. Furthermore, she has conducted studies, state reports and intervention in restoration of ceramics, enamels, glass and stained glass of all periods and cultures that gives her a great technical overview. As a consultant in preventive conservation, she also carries out preliminary studies for collections, museum and monuments. And finally, she taught restoration techniques and materials for 20 years at Institut National du Patrimoine.

- **Lore Troalen** is an Analytical Scientist at National Museums Scotland. She holds a PhD in Chemistry from the University of Edinburgh in the field of Historic Dye Analysis. Since 2012, she has led the program of Collections Sciences with overall responsibility for the application of non-invasive and micro-destructive analytical techniques to the study of the museum collections. She is a member of the Royal Society of Chemistry and a Fellow of the Royal Microscopical Society.
- **Liz Watkins** research interests include colour, its theories, technologies, and materiality in photographic and film archives. She is Chair of the British Association of Film, Television and Screen Studies and has held research fellowships at the National Maritime Museum Greenwich and Harry Ransom Research Center, University of Texas at Austin. Her publications include essays in *Screen, Journal for Cultural Research, photographies and Parallax*. I have co-edited books on *Color and the Moving Image* (Routledge, 2013), *British Colour Cinema* (Bloomsbury 2013) and *Gesture and Film: Signalling New Critical Perspectives* (Routledge, 2017).

Colour, Tints and Tones: the Politics of Early 1900s Expeditions

The use of colour tints and tones in non-fiction silent film travelogues ‘functioned as a contradiction: a mass-market space for contemplation’ (Peterson 209) by offering images of sensory environments of unknown geographical locations to viewers in industrialised regions. However, an investigation of the letters, notebooks, and trade papers exchanged between early 1900s polar explorers (1898-1914), photographers, and film laboratory workers further indicates a complex of cultural, technical, and representational factors that influenced the selection and application of colour tints and tones. For example, blue tones which were often used to compensate for a poor quality print, were interleaved with green tints commonly associated with the ‘nature’ of a landscape other than the polar environment depicted, and set alongside elaborate combinations of tints and tones utilised for their sensory effects. This presentation examines the material history of photochemical processes used in inhospitable environments (watermarked by condensation, overexposed by light refracted from the ice) as they intersect with sensory colour designs of tints and tones (Yumibe 2012). Continuities in the use of colour can be tracked across the photographs and films of several polar expeditions (1898 -1914) through their connections to the Gaumont Film Company and Joseph Kinsey as New Zealand -based agent.

Within this historic network of photographic and colour practices, does the intersection of ‘pretty’ (Galt 2011) non-indexical, cultural, and pragmatic colours, have the potential to disturb the visual organisation of unknown geographical spaces or the chronological order of expedition narratives? If colour can emphasise or diminish details the photographer considered salient, and connect with *how* we know the past through historical images (Crane 2008), can it disrupt the representation of social and geographical territories in the politics of early 1900s expeditions and their reception?

- **Ralf Weber**, PhD is a Senior Research Professor of Architecture at the Faculty of Architecture, Dresden University of Technology and heads the University’s Color Competency Research Center and Color Teaching Collection that functions as the nucleus for interdisciplinary studies of color in the sciences and arts. He has held various offices in AIC and is also a member of the AIC Study Group on Environmental Color Design He received his Diploma in Architecture at the University of Dresden and thereafter he practiced architecture in the office of Rolf Gutbrodt/Frei Otto and taught at Stuttgart University before moving to Berkeley, CA, USA in 1980 where he received a PhD in Design Methodology, Environmental Psychology and Aesthetics. He taught for several years at UC Berkeley before he returned to Dresden after the reunification of Germany, when he was appointed Chair for Spatial Design in Architecture. He has held visiting professorships in Ankara, Kent State, Florence, Potsdam and the School of Architecture, University of Oregon, Eugene. In his teaching and research he attempts to build bridges between the disciplines of architecture and design on the one hand and the theories of aesthetics and visual perception on the other. He is the internationally published author of the books: *On the Aesthetics of Architecture*; *Aesthetics and Architectural Composition*; and *Thema Material* as well as numerous articles in the fields of architecture, aesthetics and environmental psychology and more recently in the field of color.

The influence of Colour Theory on artistic colour composition in garden and landscape design during the 19th century and the beginning of the 20th century

This paper will explore the mutual relationship between colour theory, painting and landscape design. I will argue that compositional colour principles in garden design often were not directly based on color theories but on compositional principles of landscape paintings which were however based on current color theories of the time.

While treatises on painting or architecture were abundant from the Renaissance on, treatises focusing on garden design became more widespread in the 19th century. In these however, there is little to be found on color theory or compositional principles that landscape designers could have consulted for their planting designs. One of the earlier treatises was published by Count Hermann von Pückler, renowned for creating numerous world famous landscape parks in Europe. While he describes in his seminal book *Andeutungen über Landschaftsgärtnerei* (1843), detailed principles of staging spaces in garden landscapes with numerous colored illustrations and lithographs he does not mention (principles) of color.

Yet landscape architects have always been inspired by colour theories, e.g. Goethe's or Runge's. Particularly influential at the fin-de-siècle was the color theory of Ostwald, who was also a hobby gardener and painter and left behind more than 1200 drawings and paintings of plants, whereby the colours he used were categorised according to his nomenclature. In collaboration with the famous horticulturalist Karl Foerster in Potsdam, he laid the foundation for a standardised colour measurement in landscape design. The result was the so-called Kruger Colour Measuring Triangles, which still belong in the toolbox of many garden planners today.

A further influence on garden design came from 19th century painters with their Arcadian landscapes. Jakob Philipp Hackert, for example, represented a landscape ideal, which in turn served as a model for garden designers. Instead of relying on the actual colours of nature, these artists often referred to contemporary colour theory when designing their ideal landscapes and composed their landscape palettes in the studio, as was Caspar David Friedrich's practice. The close relationship between painters and landscape architects ultimately became a mutual source of inspiration for painters, theorists and garden designers: Claude Monet (1840-1926), Max Liebermann (1847-1935) and Emil Nolde (1867-1956) all reflect upon the topic of colour, light and the garden in their artistic work.

With the combination of growth patterns, shapes and plant dyes the first scientific foundations of color composition in landscape design were created around 1800, these were further developed and refined by experienced garden designers and dendrologists such as Friedrich Ludwig von Sckell, Gustav Meyer or Eduard Petzold: skillful combinations and surprising colour varieties became a desired breeding and design principle in the times of historicism.

The paper's argument will be supported with examples from the Ostwald Foundation in Groß Botten and the University of Dresden's Color Teaching Collection.

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Art, perfumery and synthetic pigments: a powdery encounter in the mid-nineteenth century

This paper will explore the relationships between the products and actors of two very flourishing industries in the mid-nineteenth century: the color and perfume industries. In the mid-nineteenth century, artists, particularly women artists, rediscovered the practice of pastel painting, which had been abandoned since the eighteenth century. The revival of this practice was supported by a considerable increase of new colors offered by merchants, partly thanks to synthetic pigments. It was also in the middle of the nineteenth century that the use of make-up, which had only been worn on stage, reappeared, opening up new perspectives for synthetic color use, such as fuchsine. This gave rise to new analogies between pastels and make-up, which had strong affinities since the eighteenth century, and which were exploited in advertising. Synthetic colors are not only linked by these common uses, they are also linked by their origins. Indeed, the progress of synthetic chemistry which enabled the appearance of new dyes was also put at the service of the perfumery, which was flourishing at this time. New scents thus came to enrich the palette of the perfumer like that of the pastelist. Whether they were olfactory or

chromatic, these innovations often came from the same techniques, or even the same chemists. William H. Perkin, for example, discovered both mauveine in 1856 and coumarin (the smell of freshly cut hay) in 1868, so it was entirely possible that his two discoveries intersected in the same *poudrier*. In addition, mauveine contributed to the publicity of the many violet perfumes such as *Vera Violetta* (Roger & Gallet, 1894) that appeared following the discovery of methylionone in 1893.

This paper will highlight how the appearance of synthetic pigments has been favorable to the commercial development of perfumer, as they pioneered synthetic chemistry, offered new colors, and reinforced the analogies between makeup and pastel art.

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Spectral Sounds : On the Colors of Vowels in 19th-Century Phonetics

The common aim of the “universal alphabets” of the 19th century was to provide a single set of symbols that would be capable of transcribing all possible sounds of human speech. The range of sound to which such alphabets were meant to answer was thus anatomically circumscribed but acoustically infinite, requiring linguists to imagine and accommodate sonic distinctions long since forgotten and yet to be heard. How does one even imagine such sounds? What means or models emerge to enable their anticipation? One of the most prominent and persistent models presents vocalic sound in the image of a color spectrum. This paper tells the story of that model, examining the cultural and historical specificity of the color theories employed by linguists as well as those linguists’ reasons for turning to color in the first place. Beginning with the vowel-color pyramid foundational to K.R. Lepsius’s *Standard Alphabet* of 1855, the paper traces Lepsius’s vowel triangle back to C.F. Hellwag’s 1781 *Dissertatio de formatione loquelae* and its triangular arrangement of additive colors to Jacob Grimm’s 1840 *Deutsche Grammatik*, Tobias Mayer’s color triangle of 1758, and J.H. Lambert’s color pyramid of 1722. It then locates a possible synesthetic basis for the vowel-color analogy in the

proceedings of the 1892 International Congress of Experimental Psychology, where Sir Francis Galton mentions that Lepsius connected colour with sounds, and assembles the archival evidence for a synesthetic intuition underpinning Lepsius's vocalic model. The paper concludes by noting the metaphorical compatibility between Lepsius's model and the ostensibly acoustic (color) terminology for vowels' distinctive features developed in the 20th century by N.S. Trubetzkoy and Roman Jakobson. Suspending the modern impulse to extirpate color metaphor in the name of scientific rigor, this paper asks why color emerged as the master model for universal vocalism in the linguistic sciences of both the 19th and the 20th centuries, situating the emergence of the vowel-color analogy within the history of synesthesia.

- **Joerg Zaun** is historian of science and technology, was from 2006 to 2015 Curator for Academic Heritage at the TU Mining Academy in Freiberg and is since 2016 Curator for Academic Heritage at the Technical University Dresden. Main research interests are in the development of scientific and technical collections.

The Establishment of Dye Chemistry as an Academic Discipline at the TH Dresden

The talk traces the establishment of dye chemistry as an independent discipline at the TH Dresden (Dresden Technical College) and its influence for the wide range of colourful textiles at the end of the long 19th century. Saxony was one of the most important locations of the textile industry in Central Europe in the 19th century. Textile and dyeing technology therefore also played a role in the training program of the Technische Bildungsanstalt Dresden (Dresden Technical School), founded in 1828. A collection of textile dyes was established at the Technical School. The professor of technical chemistry Wilhelm Stein (1811-1889), who had been working at the Technical School since 1851, expanded this collection, published on questions of textile dyeing and, as early as the 1860s, carried out the first experiments with the new synthetic tar dyes. In 1893 Richard Möhlau (1857-1940) was appointed professor of dye and textile chemistry at the TH Dresden, which in the meantime had emerged from the Dresden Technical School. Möhlau simultaneously became director of the newly founded Laboratory for Dye and Textile Chemistry, the first university laboratory of its kind in German. Dye chemistry had thus established itself as an independent academic discipline. In just a few years, the laboratory provided a decisive impetus for the German dyestuffs as well as the textile industry. On the one hand, through many well-trained dye chemists who left the TH Dresden. On the other hand, through ground breaking research results. But even colour photography and

colour film, which were to reshape our media environment in the 20th century, received impulses from the early work at this laboratory.