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# Journal of the Institute of Conservation

## Research article

# The development of Northumbria University collections, materials and conservation research archive

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## Abstract

This paper discusses issues that are common to conservation archive collections in the UK. It focusses on Northumbria University, where a significant number of artworks on canvas and paper, diaries, sketchbooks, artist materials, technological and scientific outputs, reconstructions, samples, photographs and digital images have been amassed over several decades in support of education and research. Although this resource is available to students and scholars, physical access is impeded by the diversity of locations where each item is held and the dependencies retrieval and supervision has on staff time. Our concern is that this valuable resource is underused because of the lack of electronic records, and whilst a few noteworthy artworks and materials are internally recorded, none are linked to heritage or educational networks. We anticipate that Northumbria is just one amongst many organisations with similar issues and that it is possible to plan for a more unified system where conservation archives and related research outputs are linked to a wider network.

## Résumé

«Le développement des collections, matériaux et archives pour la recherche sur la conservation de l'Université de Northumbria»

Cet article traite des problèmes qui sont communs aux collections d'archives de conservation au Royaume-Uni. Il se concentre sur l'Université de Northumbria, où un nombre important d'œuvres d'art sur toile et papier, agendas, carnets de croquis, matériel d'artiste, données technologiques et scientifiques, reconstitutions, échantillons, photographies et images numériques ont été amassés au cours de plusieurs décennies en faveur de l'éducation et de la recherche. Bien que cette ressource soit disponible pour les étudiants et les chercheurs, l'accès physique est restreint du fait de la diversité des lieux où chaque élément est conservé, du fait que la récupération dans les dépendances et la supervision prend du temps au personnel. Notre préoccupation est que cette précieuse ressource est sous-utilisée en raison du manque d'enregistrements électroniques, et tandis que quelques œuvres d'art et des matériaux remarquables sont enregistrés en interne, aucun n'est reliés au patrimoine ou à des réseaux éducatifs. Nous prévoyons que Northumbria est juste une organisation parmi de nombreuses ayant des problèmes similaires et qu'il est possible de prévoir un système plus unifié où les archives de conservation et les résultats de recherche connexes sont reliées à un réseau plus large.

## Zusammenfassung

„Die Entwicklung des Collections, Materials and Conservation Research Archive an der Universität von Northumbria“

Dieser Artikel diskutiert Themen, die Bestandserhaltungsarchive im Vereinigten Königreich betreffen. Der Fokus liegt auf der Universität von Northumbria, wo eine große Zahl von Kunstwerken auf Leinwand und Papier, Skizzenbücher, Künstlermaterial, technologische und wissenschaftliche Ergebnisse, Rekonstruktionen, Proben, Photographien und digitale Bilder in den letzten Jahrzehnten zur Unterstützung von Lehre und Forschung zusammengetragen worden sind. Obwohl diese Ressource Studenten und Forschern zur Verfügung steht, ist der physische Zugang aufgrund der verstreuten Lage und des Zeit- und Betreuungsaufwands der Mitarbeiter sehr begrenzt. Unsere Sorge ist, dass diese wertvolle Ressource aufgrund des Fehlens elektronischer Daten relativ unbenutzt ist, und dass, obwohl einige herausragende Kunstwerke und Materialien intern verzeichnet sind, keines in den nationalen Netzwerken der Lehre oder Kultur verzeichnet ist. Wir gehen davon aus, dass Northumbria nur eine Institution von vielen ist, auf die dies zutrifft, und dass es möglich ist ein einheitliches System zu planen, in dem Bestandserhaltungsarchive und ähnliche Forschungsressourcen in einem weiteren Netzwerk erfasst sind.

## Resumen

“El desarrollo de las colecciones del Archivo de Materiales y de Investigación de Conservación de la Universidad de Northumbria”

En este artículo se analizan problemas comunes a la conservación de las colecciones de archivos en el Reino Unido. El artículo se centra en la Universidad de Northumbria donde un número significativo de obras de arte sobre lienzo y papel, diarios, cuadernos de dibujo, materiales de artistas, productos tecnológicos y científicos, reconstrucciones, muestras, fotografías e imágenes digitales se han ido acumulando a lo largo de varias décadas de apoyo a la educación y la investigación. A pesar de que los estudiantes y académicos disponen de acceso a este valioso recurso, su uso es limitado. El acceso es difícil ya que están almacenados en lugares distintos y se necesita que el personal disponga del tiempo necesario para su recuperación y supervisión. Nuestra preocupación es que este valioso recurso está infrutilizado debido a la falta de registros electrónicos; aunque unas pocas obras de arte y materiales destacadas están documentadas internamente, ninguna de ellas está vinculada a las redes educativas o del patrimonio. Creemos que Northumbria es sólo una de las muchas organizaciones con problemas similares y que sería posible planificar un sistema más unificado en el que los archivos de conservación y los productos relacionados a su investigación estén vinculados a una red más amplia.

## 摘要

诺桑比亚大学藏品、材料和保护研究档案的发展

本文讨论的是有关英国保护档案藏品的常见问题。以诺桑比亚大学为例，数十年来这里已积攒了大量的布上和纸上艺术品、日记、素描本、艺术家资料、科技产物、复原物、样品、照片和数码图像供教育和研究之用。尽管资源已向学生和学者开放，但在实际使用上总是受限于地点多样性的问题，而且随之而来的退还和监管工作占用了员工许多时间。我们担心这样的宝贵资源因缺乏电子文件而未被充分利用，而且一些值得关注的艺术品和资料也只是内部存储，并未链接到文化遗产或教育网站上。我们预

计诺森比亚大学仅仅是存在这类问题的众多机构中的一家，因而可以规划一个更加统一的系统使保护档案和相关的研究成果链接到更加广泛的网络中去。

Keywords: [conservation](#), [archives](#), [interpretation](#), [integration](#), [access](#), [network](#),

## Introduction

This article sets out the difficulties faced by any institution that wishes to consolidate and make accessible its disconnected holdings as related to conservation practice and research, and points to a number of initiatives charged with addressing such problems. Experts, scholars and related professionals including conservators, scientists and art historians involved in the multidisciplinary tasks of studying, protecting and conserving works of art are exponentially increasing their need to access ever more complex technical, historic and scientific data generated in the pursuit of knowledge. Whilst such content generation enables a greater understanding of the properties, application, ageing, compatibility and evaluation of materials present in works of art, a consequence is that this work leads to an accumulation of a wide range of diverse materials and outputs including:

- Historic reconstructions, models and reference samples;
- Prototypes of synthesised conservation materials;
- Documents (typed, handwritten or stored as computer files) including published or unpublished condition reports, scientific reports, as well as recipes of artist materials;
- Artists' workbooks, treatises, diaries, compendiums and trade catalogues;
- Scientific data in the form of charts, graphs, diagrams and spectra generated by a wide range of optical, physicochemical and mechanical analytical methods;
- images and photographs of works of art, artists' materials or samples captured under a variety of lighting conditions and excitation methods; and
- a wide range of stored processed or unprocessed samples extracted from works of art that have been studied in the past or reserved for future studies.

Many of these conservation-related resources are held in a variety of institutions ranging across regional and local museums, galleries and historic properties, all of which operate their own individual archive and recording systems. Access and retrieval of such information can be sporadic and further complicated by copyright and policy restrictions upheld by each institution. In the higher education sector, where conservation is taught and where its research can lead to developments in conservation practice, technology and science, the continuous accumulation of this valuable data is increasingly difficult to resolve as there is no unified system fit for capturing these wide-ranging activities. Whilst some research gravitates naturally into the public domain through publication, other work, which can be of equal value, is more transient in nature and often less amenable to forming a part of the main institutional record. This problem also extends into wider professional domains, particularly for those involved in the scientific and technical documentation of artworks and cultural heritage. Furthermore, it is also a common tradition in all areas of conservation to engage in short-term or pilot projects, and often this work, which could inform countless future projects, remains fragmentary and buried in paper or digital form in repositories that are almost impossible to access.

## Art conservation archives and universities

It is widely acknowledged that there is a growing trend in all but a few UK art conservation programmes for a reduction in academic staff, which stands in sharp contrast to the rise in student numbers. In addition, in 2012 the UK's professional body for conservation, the Institute for Conservation (Icon), highlighted in its *National Conservation Education & Skills Strategy* that UK conservation courses are 'resource heavy' and in the past have relied on a 'considerable amount of one-to-one teaching due to the process nature of the learning'.<sup>1</sup>

The advent of larger student numbers is now prompting many course tutors, including those at Northumbria, to spend more time creating quality learning materials that test and stretch the students' practical, diagnostic and critical evaluation skills and yet relieve them from the pressures of working on real artefacts which require more supervision. This approach encourages a more reflective and independent way of learning and, as a result, is popular with students. To support this new self-study approach, archive collections built from a range of materials and objects that can be used to demonstrate decay processes, failures and successes of conservation treatments and so on, are central. This importance is compounded by the current drive for all universities to increase their 'impact', interaction and collaboration with regional, national and international institutions. Thus developing an interactive online archival resource which combines data on artist materials, collections, and technical and scientific studies focussed on cultural heritage will be a significant step forward for conservation and a great asset for its future teaching, learning and research.

Northumbria University is well placed to contribute to such a development by utilising its unique collections which include:

1. early and mid-twentieth century British and European works of art on canvas and paper including diaries and sketch books;
2. European and Oriental supports, as well as historic pigments, dyes, mediums, adhesives and resins;
3. frames and frame components, several of which date back to the mid-eighteenth century; and
4. documentation and analytical outputs, such as multispectral images, X-rays and actual samples extracted from works of art and generated for microscopic, spectroscopic and mass spectrometric studies.

Whilst this comprehensive resource is catalogued and in theory available for study, physical access is impeded by the diversity of locations in which each item is held combined with the significant reliance any item's retrieval and supervision has on staff members' available time. Our concerns are that this resource is underused because there are currently no accessible electronic records available, and whilst a few noteworthy artworks and materials are internally recorded, none are linked to other appropriate heritage or educational networks.

Although there is no clear reference in Icon's *National Conservation Education & Skills Strategy* as to how constructed materials, self-study approaches and access to comprehensive archives might offer a way through current educational challenges, there is a growing support within Icon, in particular its Documentation Network group, for the initiation of such an accessible and networked archival project.

## **Strategies and models for optimising the management of the material archives**

There are several good models in other domains where education and research are combined to generate new knowledge.

An excellent example is the rapidly developing field of ‘Technical Art History’, a discipline which has developed its own methodologies for capturing and interpreting a diverse assortment of artworks, technical data, scientific analyses, historical reconstructions and a variety of written and published sources materials. However, most of this work is confined to specialist publications and websites and is yet to be amalgamated into any wider online archive.<sup>2</sup>

Other developments in the integration of material related to works of art have been established in the *Art Technological Source Research Group* (ATSR) which forms part of the International Council of Museums Conservation Committee (ICOM-CC) framework.<sup>3</sup> Experts from diverse backgrounds work together within this group to exchange a range of historic, practical and scientific data alongside samples and reconstructions for the mutual benefit of a number of professional domains including art conservation and conservation science.<sup>4</sup>

The challenge is to form a parallel working group within the UK made up of professionals willing to collaborate and coordinate similar initiatives. Such a group would discuss appropriate ways in which to classify, interpret and cross-reference existing archival material as a resource, with any analogue and digital outputs in the form of primary data and metadata (data about data) being diligently evaluated before making such a resource available. For example, any multi-media collections would need to be organised to accord with the standards set in the policy document, International Standard Archival Description General (ISAD)G published by the International Council on Archives Committee on Descriptive Standards.<sup>5</sup>

## **The complexities involved in working with documents, manuscripts and text files**

Nadolny et al. recognised that interpreting texts is a complex matter as many documents are stored in electronic format and saved on various media including defunct hard drives, whilst others are in printed or written form.<sup>6</sup> These authors recommend that treatises and diaries should be evaluated by reading, whilst decryptions of abbreviations, unclear hand-written annotations, notes and texts written in various languages should be transcribed as exact digital copies to facilitate sharing and accessibility. In the case of such treatises and diaries, additional information may be included in appropriate and robust online repositories similar to examples such as the Rembrandt Database.<sup>7</sup> Related material to these documents, in the form of scientific data, photographs, samples, reconstructions, published articles and metadata should also be made available and studied in parallel to verify and complement interpretation. This should be understood as promoting an objective approach when primary data and metadata are further processed.

## **Working with sample materials, mock-ups and reconstructions**

In addition to the list of holdings cited above which form the bulk of the Northumbria archive, a diverse range of authentic teaching materials and historical reconstructions of

works of art on wood, canvas and paper are also retained. Although sometimes valued and recorded,<sup>8</sup> often such reconstructions are left undocumented in collections when their immediate use has expired. Arguably, if they were added to an archive, then characteristics, such as ageing, can be monitored, compared and contrasted with the materials used in the original art work and also with similar case studies to form the basis for future studies. These materials could also provide additional practical research value when used, for example, in cleaning tests or subjected to a range of extreme microclimates that give rise to additional chemical or physical material interactions.

It should be noted that critically re-evaluating such constructed materials will always be necessary as errors in their production, uncontrolled storage and handling conditions may have altered them irreparably thus provoking ambiguous results in any subsequent testing regimes. For example, cross-sections and resin-embedded samples of fibres and historic pigments would normally be extremely useful during any re-examination of the parent artwork. There is however a risk that many of the auxiliary sampling materials, such as polyester mounting resins, micro-chemical dyes and stains have been altered due to the passage of time and may no longer be inert or inactive. Another area of complexity is the continuous requirement to update technological and scientific data as generated by analytical instruments with renewed specifications and properties as compared to older devices.

## **Working with photographs, images and related materials, data and metadata**

Storing and archiving photographs and films such as slides, overhead projector transparencies and negatives, as well as complementary analogue materials which include reports and metadata of various types, is not as straightforward as saving digital images onto a computer's hard drive. This is a complex issue for all conservation studios which hold records from before the introduction of digital imaging in the 1990s. Old analogue photographs commonly contain valuable and detailed evidence of the examination process and condition of the artwork before, for example, non-reversible treatments commenced. However, digitisation of these photographic records does not always save the information accurately given that archived photographic prints may have faded and discoloured whereas negatives and overhead transparencies often will have deteriorated much more slowly.<sup>9</sup> Despite the invaluable information provided by archived images, researchers should also be aware that reflected, visible light and ultraviolet fluorescence photographs are particularly prone to fading and colour change, hence interpretation and colour-matching is essential and another area that needs more careful study.

## **Data integration for conservation**

The importance of integrating a diverse range of conservation-related data and materials in a meaningful way has already been emphasised by a number of collaborative research projects including the Getty Conservation Institute (GCI) *Data Integration for Conservation Science* project (DISCO), a variety of projects under the European Commission's Seventh Framework Programme such as *ARIADNE*, *CHARISMA* and *IPERION-CH*, and the Andrew W. Mellon Foundation project *Conservation Space*. Other related projects include case-studies on Van Eyck and Hieronymus Bosch.<sup>10</sup>

Currently, such research into methodologies for the linkage of conservation information generally focusses on integrating data and outputs by grouping them in corresponding domains in an attempt to encourage their interrogation by a broad range of researchers from a



diverse range of backgrounds. In support of this, there is a trend towards developing software and integration models involving complex tasks such as:

1. The evaluation of primary data as well as sample- or object-related metadata in multidisciplinary fields related to and including art conservation and conservation science;
2. The development of open source data methodologies; and
3. Setting metadata standards and the design of logical classification models for processed data and metadata.

Another important objective is the optimisation of technology and science to continue to contribute in the study of artworks. Computer science will play a crucial role to reach this goal, particularly as current funding opportunities through various consortia aim not only at building new databases, but also at facilitating access and sharing of information by users from diverse communities.

In conclusion, as a first step to securing such objectives, organisations with important collections, materials and conservation research archives, such as Northumbria University, must be part of a larger network. Combined initiatives will enhance the chance for access, utilisation and management of material at local, national and international levels. It will also contribute to academic excellence and collaboration, the development of conservation practice, and will indirectly impact on the wider heritage and cultural industries.

## Notes

1 The Institute of Conservation (Icon), *National Conservation Education and Skills Strategy 2012–2016*, [http://icon.org.uk/system/files/documents/ncess\\_strategy.pdf](http://icon.org.uk/system/files/documents/ncess_strategy.pdf) (accessed 27 June 2016).

2 See, for example: Stefanos Kroustallis, Joyce H. Townsend, Bruquetas E. Cenalmor, Ad Stijnman and Margarita San Andres Moya, eds, *Art Technology: Sources and Methods* (London: Archetype Publications, 2008); Marika Spring, ed., 'Studying Old Master Paintings: Technology and Practice', in *The National Gallery Technical Bulletin 30th Anniversary Conference Postprints* (London: Archetype, 2011); Mark Clarke, *The Art of All Colours: Medieval Recipe Books for Painters and Illuminators* (London: Archetype, 2001); an example of an educational resource for historical painting reconstructions is the University of Delaware's Technical Art History website, <http://www.artcons.udel.edu/about/kress> (accessed 6 July 2016).

3 Publications from this group include: Mark Clarke, Joyce H. Townsend and Ad Stijnman, eds, 'Art of the Past: Sources and Reconstructions: Proceedings of the First Symposium of the Art Technological Research Study Group' (London: Archetype, 2005); and Sigrid Eyb-Green, Joyce H. Townsend, Kathrin Pilz, Stefanos Kroustallis and Idelette van Leeuwen, eds, *Sources on Art Technology: Back to Basics* (London: Archetype, 2016).

4 See, for example, Mark Clarke's, 'A Nineteenth-Century Colourman's Technology', *Studies in Conservation* 54 (2005): 160–9.

5 International Council on Archives—Committee on Descriptive Standards, <http://www.icacds.org.uk/eng/home.htm> pdf (accessed 27 June 2016); the General International Standard Archival Description, [ISAD(G)], [http://www.icacds.org.uk/eng/ISAD\(G\).pdf](http://www.icacds.org.uk/eng/ISAD(G).pdf) (accessed 7 July 2016).

6 Jilleen Nadolny, Mark Clarke, Erma Hermens, Ann Massing and Leslie Carlyle, 'Art Technological Source Research: Documentary Sources on European Painting to the



Twentieth Century, with Appendices I–VII’, in *Conservation of Easel Paintings*, ed. Joyce Hill Stoner and Rebecca Rushfield (London: Routledge, 2012), 3–32.

7 The Rembrandt Database—Research Resource on Rembrandt Paintings, <http://www.rembrandtdatabase.org/> (accessed 27 June 2016).

8 See, for example, Leslie Carlyle, ‘De Mayerne Programme: The Historically Accurate Oil Painting Reconstruction Techniques (HART) Report 2002–2005’, in *Reporting Highlights of the De Mayerne Programme*, ed. Jaap J. Boon and Ester Ferreira (The Hague: Netherlands Organization for Scientific Research, 2005), 63–76, [http://assets.kennislink.nl/upload/181089\\_391\\_1193921849265-HighlightsMayerne.pdf](http://assets.kennislink.nl/upload/181089_391_1193921849265-HighlightsMayerne.pdf) (accessed 12 July 2016).

9 See: Canadian Heritage Information Network, *Creating and Managing Digital Content*, <http://www.rcip-chin.gc.ca/index-eng.jsp> (accessed 27 June 2016).

10 The Getty Conservation Institute Project, *Data Integration for Conservation Science* (DISCO), [http://www.getty.edu/conservation/our\\_projects/science/integrating\\_data/index.html](http://www.getty.edu/conservation/our_projects/science/integrating_data/index.html); The European Commission Seventh Framework Programme projects, *ARIADNE* (Advanced Research Infrastructure for Archaeological Dataset Networking in Europe) <http://www.ariadne-infrastructure.eu>, *CHARISMA* (Cultural Heritage Advanced Research Infrastructures. Synergy for a Multidisciplinary Approach to Conservation/Restoration), <http://www.charismaproject> and *IPERION-CH* (Integrated Platform for the European Research Infrastructure ON Culture Heritage), <http://www.iperiumch.eu>; the Andrew W. Mellon Foundation Project *Conservation Space: Networks for the Exchange and Management of Conservation Data*, <https://sites.google.com/site/conservationspace/>; *Closer to Van Eyck: Rediscovering the Ghent Altarpiece*, co-funded by the Flemish Government, the Getty Foundation and the Province of East Flanders, <http://clostertovaneyck.kikirpa.be/#>, and the Bosch Research and Conservation Project, <http://boschproject.org> (all accessed 27 June 2016).