



After the Black Death: Painting and Polychrome Sculpture in Norway, 1350–1550

Eivind Engelstad's 1936 book *Senmiddelalderens kunst i Norge* remains the most comprehensive effort to catalogue the altarpieces, shrines, sculptures and crucifixes that have survived in Norway from the late-medieval period. His approach to these objects was fitting for his time – an attempt to categorise late-medieval church art by style, which led him to assign the majority to workshops in Lübeck. However, it is clear today that Engelstad's art-historical methods were inadequate. He could not describe the original or interim physical appearances of these objects. Neither could he locate them within a nuanced cultural discourse.

With the vast advances in scientific instrumentation over the past 75 years, it can be said with some certainty that the characterisation of the materials found in these objects will generate new primary source materials for conservators, scientists and historians alike. One aim of this project is thus to draw on this data – and to create new and more accurate narratives for the ways that the c. 65 objects in Oslo were made and have changed over time. These material histories will in turn inform scholarly debates over the ways that these objects have been variously valued and restored, then neglected, conserved and consigned to storage. In total, interdisciplinary research tied to publications and exhibitions will initiate physical, then intellectual access to objects that are difficult to read. Publications and exhibitions associated with this project will address directly the pre-conditioned notions that surround their actual and symbolic connections to the Hanseatic League, pre-Reformation religious practices and Norway's dependency on external economies, especially after 1350.

Questions and agenda

Initial investigations commenced in 2010, addressing the question: What can the physical examination, material characterisation and systematic documentation of the objects in the Oslo collection reveal about the circumstances of their production and their original appearances? Conservators together with materials scientists have begun to offer interpretations of resulting scientific data from surviving paint and gilding, as well as from the wooden supports and framing devices. This first task, to develop material histories (or object biographies), will enable a broader network of researchers to take the next steps. Thereafter investigations will follow these objects over time: positioning them as 'Hanseatic' objects; as church objects that have changed dramatically over time; and as museum objects that are conserved and, on occasion, exhibited. For many reasons, the majority of this collection has long been in storage.

The significance of damage and changing physical appearances will continue to be central to the research agenda. Moreover, the phase of research devoted to applied material studies leads organically to topics concerned with the re-evaluation and display of objects that are damaged, some profoundly, but which have also been previously devalued as Catholic, unrefined and foreign. From an early stage in the planning of this project, it was clear that understanding the nature of damages and repairs (e.g., overpaint) can facilitate intellectual access to how these objects were valued and used, both prior to the Reformation and since.

The final phase of this project will focus on previous and current identities of these non-Norwegian objects within a museological context, to arrive at a new understanding of how the objects and their histories are vital and relevant today. Exhibitions staged at the Museum of Cultural History (KHM) will aim to address historical arguments surrounding Norway's decline after 1350, as well as 'cherry-picking' from the past – a common approach during Norway's period of nation-building. Negative associations have clearly played a role in shaping attitudes to 'Hanseatic' objects, which were once ubiquitous in churches throughout Norway. The re-evaluation of the collection aims to emphasise the importance of the past in the present, which is especially relevant to exploring the role of the past in current debates on, for example,

identity formation – how the tangible and intangible heritage is assigned value and understood by audiences. In this way, conservation research has profound contemporary implications: it is not simply about documenting, repairing and preserving, but also about keeping alive the aspects of objects that are eclipsed by their public image.

This project description is divided into three parts:

- I. Background and status of knowledge
- II. Approaches, hypotheses and methods
- III. Project organisation, cooperation, project management and dissemination

The final section includes a table with project members for whom NFR funding is sought.

I. Background and status of knowledge

The late-medieval collection in Oslo is virtually unknown to scholars in other parts of Europe and in the United States. It is neither visible in the museum galleries, nor on-line, nor has a systematic study been published since Engelstad's 1936 book. At present, this collection is a little-known but valuable resource for enlivening discussions of the cultural objects that were lost in other parts of Europe during iconoclastic riots, Napoleonic campaigns and two World Wars.

To develop a platform for collaborative object-based technical and historical research, Noëlle Streeton, Associate Professor for Conservation Science, UiO, and Kaja Kollandsrud, KHM Senior Painting Conservator, organised a two-day international forum in November 2010.¹ The event was designed as a round-table, to discuss fruitful ways to build on 30 years of scholarship devoted to the University's collection of Norwegian altar frontals and early medieval sculpture (ca. 1100–1350). The early-medieval group is quite homogenous, made up of objects that are, with few exceptions, the products of Norwegian workshops. The late-medieval collection cannot be similarly categorised. Thus the remit for the forum was to assess the feasibility of studying a far more diverse group.

Admittedly, this was a narrow remit but nevertheless the level of interest in the topic far surpassed expectations. The initial plan for a single day of lectures was expanded to two, which ultimately attracted an international audience of 80+ members each day. The 22 invited speakers addressed questions about the KHM collection and similar medieval liturgical objects in Scandinavian museums or in other regions of Europe. Far beyond this, though, participants demonstrated the intellectual and practical benefits of collaboration between conservators, materials scientists, social scientists and historians (of art, religion and the economy).

From this experience it is clear that interdisciplinary object-based investigations of the late-medieval collection in Oslo will make a substantial contribution to the historiography of late-medieval European painting and craft practices, among other topics. Archetype Publishers in London will publish the post-prints in April 2014, edited by Streeton and Kollandsrud. This publisher was also responsible for *Medieval Painting in Northern Europe*, the Festschrift in honour of Unn Plahter, which itself charted the course of complementary scientific and historical research,² a research tradition that forms a theoretical foundation for the proposed project.

Growth of the field in Europe and Oslo

The coupling of scientific research and historical studies has a rich history rooted in nineteenth-century positivism and positivist values attached to the identification of painting materials and techniques for their own sake.³ From the 1840s, British and German authors in particular were pursuing enquiries related to the innovations of northern European painters, with the aim of gaining a scientific underpinning for their historical narratives of medieval artistic practices.⁴ However, despite their best efforts, this aim was not generally appreciated in historical circles until after the Second World War. The damage sustained by displaced European cultural objects during the war was the catalyst for change, which from the 1950s brought scientists, historians and conservators together in new ways.⁵

Out of a sense of urgency and common interests, a number of heritage research institutes were founded, including the Belgian Royal Institute for Cultural Heritage (IRPA/KIK) in Brussels. IRPA/KIK was led by the chemist, Paul Coremans, who visited the University of Oslo in 1961 to propose the establishment of a museum research laboratory at KHM. Soon

after this visit in 1963, Unn Plahter was hired as a museum chemist and since, Professor Plahter's career has been largely devoted to studying the physical makeup of early-medieval Norwegian painted objects (to 1350). She has gathered analytical evidence for pigments, binding media, layer structures and wooden structural elements; and together with Norwegian, English and Swedish colleagues has been able to declare that Norwegian altar frontals and polychrome sculpture were largely painted in an oil technique.⁶ As a direct result of this and complementary studies around Europe and the United States, the history of early oil painting has been re-written. An innovation that had once been attributed to Netherlandish painters like Jan van Eyck has now been revised, not according to guesswork and opinion, but based on analytical evidence for Scandinavian painters, among others.⁷ These findings have redefined the parameters of the technical knowledge possessed by painters working in the Netherlands, northern Germany and in Scandinavian lands throughout the medieval period.

Challenges to interdisciplinarity between the Humanities and Physical Sciences

This work has made Oslo a hotbed for new ideas, attracting an international following to medieval research in Norway. Thus the challenge is not attracting partners. Rather, the challenge remains to justify the results from scientific studies of painted objects in published historical narratives – that is, ones that might be accepted by those working within the disciplinary boundaries that structure disparate academic fields (esp. chemistry and history). Each of these fields has differing formal, theoretical and analytical approaches to the study of cultural objects, but boundaries are inevitably distorted during interdisciplinary research projects. These boundaries have long been blurred by conservators, who initiate their projects like a scientist (formulating a hypothesis and conducting experiments to support or refute it) but then turn toward historical sources and methods for the contextualisation of their results. In short, while conservators commonly take their cue from ideally neutral data gathered from objects via scientific methods, the historical interpretation of scientific information (alongside, for example, evidence for a painter's intentions, their social milieu and interaction with broader economic phenomena) is grounded in the methods and philosophies of the Humanities.

The question here must be then: Is this problematic? In some instances, the answer is most certainly 'yes'. For art historians engaged with emotional responses to creative expression, they quite rightly maintain that the objective aims of the sciences are, for their purposes, ill-suited to describing the unquantifiable aspects of a work of art. Nevertheless, the contributions of conservators, among others, to the emerging field of 'technical art history' have been significant.⁸ This is especially true where medieval objects are concerned, chiefly because the objects themselves are often the most important primary source material. Jørgen Wadum and Streeton have long been active in this field, studying the physical fabric of paintings, associated documentary evidence, structural damages and dossiers compiled during previous conservation or restoration treatments. Each facet of evidence potentially contributes to a new historical narrative, but the impact of these narratives is limited without collaboration between conservators, scientists, historians and anthropologists. Such broad engagement ensures that associations can be made between material evidence and its implications, while encouraging contributors to understand the data and language of complementary scholars.

II. Approaches, hypotheses and methods

Streeton and Frøysaker initiated object-based research in 2011, focussing first efforts on the eight altarpieces and intact shrines in the Oslo collection. Kristin Kausland, PhD research fellow in Conservation Studies, joined the Institute of Archaeology, Conservation and History (IAKH) in January 2012 specifically to contribute to the 'After the Black Death' project. Kausland has proceeded with examinations (see methods below), producing written and photographic documentation to supplement earlier conservation reports, which date mainly to the 1920s and 1960s/70s.

Examinations have focused in particular on how each object was made and on material markers that indicate how and when objects were crafted, modified, repaired, repainted or restored. This initial phase is in itself a significant step forward, primarily because unlike the early-medieval collection at KHM (pre-1350), the late-medieval objects have yet to enter

ongoing discussions of similar surviving altarpieces in other European museums. This comes down partially to access. Apart from the altarpiece from Kvæfjord church (Figure 1) and two wooden figures of Saint Sunniva and Mary Magdalene from Karlsøy (c. 1520) the remainder of the collection has not been part of the permanent exhibition since the 1970s.



Fig. 1 Kvæfjord I Altarpiece, c. 1520, KHM

New examinations of these objects are eagerly awaited by historians with vested interests in so-called Hanseatic art. Results of technical examinations will open a window on the ways that these objects were assembled, for example in workshops in the region of Lübeck, and perhaps re-assembled and modified on arrival in the port of Bergen. The classification of object types made for export, in Lübeck, Cologne, Antwerp and Utrecht, has consequences for understanding the roles of merchants (Hanseatic and Netherlandish) in bringing objects to Norwegian ports, as well as the contributions of craftsmen working outside the Bergen *Kontor*, for which no documentary evidence has survived.⁹ Material evidence is equally anticipated by religious historians wishing to substantiate theories for how images of polychromed figures were used. Figures of the Virgin and Saints Olaf and Sunniva, but also Anthony, Barbara, Bernard, Birgitta, Catherine, Eligius, John and Ursula were revered and relied upon for their healing and/or talismanic powers in a period of recurrent plague – potency that was maintained through repairs and repainting as the objects aged or were damaged.

These themes have been on the rolling agenda of the UiO research group, ‘Objects and Beliefs in Norway’, which has been convened by Jón Viðar Sigurðsson (UiO, History) and Streeton since August 2011 as a platform for the ‘After the Black Death’ project. In relation to this group, Sigurðsson and Streeton commissioned a bibliography of recent publications on late-medieval religion and the cult of saints since Eamon Duffy’s, *The Stripping of the Altars* (2005). They also organised a one-day workshop in November 2012, ‘*Gjenstander og religiøse forestillinger 1350–1650*’. These efforts were supported by UiO *småforsk* funds (NOK50.000). Ultimately, these initiatives have sought to create and implement sound models for interdisciplinary research between conservators, historians, chemists and social scientists, who will inevitably take their narratives in new and exciting directions.

Questions and methods: object-based enquiries

Investigations relevant to conservation have been guided by the question: What can the physical examination, material characterisation and systematic documentation of the objects in the Oslo collection reveal about the circumstances of their production and their original appearances?

Frøysaker, Streeton and Kausland are examining selected objects and reviewing their conservation histories – which are embedded in existing KHM conservation dossiers and more limited archival sources related to ownership and later removal from churches.¹⁰ To date they have identified a core group on which to focus, which includes the eight altarpieces, plus roughly 10 other painted objects. Catalogue notes and reports on earlier treatments exist for the majority of these, but this documentation is highly varied. In connection with her PhD research (2012–2015), Kausland is updating the dossiers with data for: wooden supports, tool marks, ground layers, underdrawing, priming/intermediate layers, original and later paint, gilding, distinctive marks, fractures, losses and current condition. (Streeton will continue this work once Kausland has completed examinations relevant to her project.)

• **Database** – Because the eventual visibility of these findings is a priority, readily searchable categories have been developed for the database system TMS (The Museum System), to be purchased with NFR funding. This database was chosen because it is the most appropriate tool, and because it is compatible with the existing Oracle database (MUSIT) maintained by Norwegian university museums for on-line searching. Espen Uleberg (KHM) has agreed to

advise on the development of on-line tools, utilizing open access software developed via projects funded by the Mellon Foundation.¹¹

° **Structural and surface examinations** – Streeton and Kausland are responsible for gathering data via surface examinations with the aid of portable hand-held microscopes (magnification $\times 50$) and more powerful stationary microscopes ($\times 500$). Visual assessments of wooden support structures (carved wooden elements and panels), format, paint layers (some highly fragmented, some overpainted more than once), gilded elements and damages are being systematically documented to form justifications for further analyses.

• **Photography** – Streeton and Kausland are producing macro-/micro-photographs plus ultraviolet and infrared images with digital photographic equipment owned by Conservation Studies. Additionally, a KHM photographer is taking new colour images of the standard required for eventual cataloguing, publication and to facilitate object mapping.

• **Non-invasive analyses** – A post-doctoral researcher will be hired for the project, based at Chemistry (UiO). The project scientist will be responsible for overseeing non-invasive analyses, including X-radiography and portable X-ray Fluorescence (XRF) spectroscopy – instruments owned by Conservation Studies. X-rays are valuable for imaging structural elements and faults; and XRF measurements of painted surfaces and surviving gilding will aid the characterisation of original and later additions.

• **Dendrochronology** – Aoife Daly at the Centre for Art Technological Studies and Conservation (CATS) in Copenhagen will undertake dendrochronological studies. These have a two-fold goal: to determine the felling date of the trees that supplied the wood from which each object was made, and to determine where the timber grew.¹² From this, she can provide a definite *terminus post-quem* for individual wooden components, as well as determining their origins. This information is critical for dating structural elements, thus supplying information to date the object more securely than is possible through any other means. On inspection of the folding altarpiece from Slagen church (left wing, Figure 2), Daly confirmed that its *caisse* (box frame) was made from slow-grown oak, and that this object, among others, fulfilled the parameters for successful wood analysis. Dendrochronological analyses will confirm or refute theories that select sculptures and their framing devices were produced in Norway from local oak, rather than Baltic oak or other wood sorts.¹³

° **Invasive analyses** – The project scientist will also undertake analyses of microscopic amounts of original material ('samples' of paint or wood), which have been removed from objects in specific locations for chemical testing. Numerous samples were taken from paint and gilding on a selection of the objects during conservations treatments in the 1960s and 70s. Many of these have never been analysed and thus this archive is highly valuable for addressing specific questions about pigments/binders in original layers, later additions, wooden substructures, previous conservation treatments and mechanisms of deterioration. When interpreted in tandem with historians, such analyses can define the differences between the current and original surface, which in turn inform opinions on the practices of painters and the meaning of changing appearances over time. A limited number of new samples might also be taken, depending on the evolution of object-specific research sub-questions. All samples will be studied by the project scientist and Streeton with a range of instruments for organic and inorganic analyses, which are owned by UiO, both in Conservation Studies and in Chemistry.

° **CATS, Copenhagen** – To check and interpret this data, samples will also be analysed by Anna Vila (Senior Scientist, CATS), with comparable instruments as in Oslo. Vila with Jørgen Wadum, Daly and Vila would apply their breadth of competences to selective studies of late-medieval altarpieces in the Danish National Museum collection, following the same methodologies as outlined above. Such complementary studies will provide a valuable comparative data set for the Oslo collection.



Fig. 2 Left wing, St Ursula Altarpiece (Slagen), c. 1470

° *European consultants* – We foresee, however, that some results will be ambiguous, for which the Oslo and CATS teams would require occasional consultation with other specialists. Jaap Boon, conservation scientist with 30 years experience characterising organic components in paint (Amsterdam), Jana Sanyova, senior conservation scientist with a special interest in ‘lake’-pigments (Brussels) and Patrick Dietemann, conservation scientist with expertise in differentiating between glues, egg and oils (Munich) would contribute as the research agenda for this project evolves.

Questions and methods: material histories and beyond

The diversity of questions that continue to arise from the material data has meant that research areas are far more plentiful than can be covered within the funding period. For this reason, historical investigations are limited to discrete projects with feasible objectives for the time-frame. The four designated research projects presented here promise to harness the findings of the materials research in valuable and innovative ways. These efforts will engage Frøysaker, Streeton, Wadum, Vila, Daly, Sigurðsson, Hartmut Kutzke (UiO) Jan von Bonsdorff (University of Uppsala) and Michelle Marincola (New York University) as active members of the scholarly network surrounding the research fellows. See Project members below.

° *Project (1): PhD research* – A PhD research fellow will ideally develop a thesis around the altarpieces that Engelstad considered to be tied to a Netherlandish tradition, rather than a Germanic one. The project will be co-supervised by Streeton and Jan von Bonsdorff and would complement Kausland’s project (also supervised by Streeton).¹⁴

The Hanseatic label for works of art from this period has too often been used indiscriminately. Thus this study aims to initiate the process of clarifying the meaning of material differences between altarpieces from distinct northern European centres of production. Differences in paint/gilding/structural elements themselves point to different origins. Significantly too these differences have implications for understanding the ways that altarpieces, shrines and individual sculpture arrived in Norway (via Antwerp, Rotterdam and/or Amsterdam). This study should develop a clearer picture of the roles of Hanseatic merchants and their Dutch/Flemish counter-parts, and distinctions between their roles in bringing painted cult figures, painted doors, their caisses and/or complete altarpieces to Norwegian ports.

In the first year of the project, the candidate will take the comparative data for diverse objects in Oslo as the point of departure for studying *in situ* a select number of altarpieces that remain in churches (e.g., at Ringsaker, Grip, Leka, Hadsel and Ørsta).¹⁵ Beyond this, the candidate will be encouraged to take the next step: to understand the Netherlandish merchant networks responsible for importing church art via, among other sources, surviving customs accounts for ports in the Low Countries.¹⁶ Given that direct evidence for the transport of altarpieces is thin, indirect evidence (such as the names of merchants who appear repeatedly in customs accounts for relevant ports) would help to support arguments for or against networks between fairs and markets, e.g., in Antwerp, Amsterdam, Bergen and Lübeck.

° *Project (2): technical-art historical research at CATS* – The PhD project will complement a project led by Wadum, which builds on his ongoing studies of guild ordinances for painters, sculptors and joiners (frame and box-makers) across northern Europe. Based on Daly’s dendrochronological results for altarpieces in Oslo, Wadum and Daly can contextualise the practices of their makers within the formal guidelines for box-makers in Lübeck, Cologne, Antwerp and Utrecht.¹⁷

This research will take place within the international research group called STIPS (Research on Sizes and Formats of Fifteenth- to Eighteenth-Century Easel Paintings and Frames in the Low Countries). STIPS systematically explores the introduction and implementation of regulated standard formats, primarily of panel paintings and their frames in the Netherlands from 1400 to 1800. Altars, paintings’ supports and picture frames were manufactured in length units that could differ from one region to another, and even between towns. This is still incompletely understood. When, where and how a system of standard formats was launched and took form will be the focus of this project.

° *Project (3): Post-doctoral research, Chemistry (UiO)* – The problematic behaviour of copper-based green paints used during the late-medieval period forms the basis for a third sub-project, building on Streeton’s earlier research. Green passages on painted wings in Oslo, Bergen, Copenhagen

and Uppsala are today far more heavily damaged than adjacent passages formed of other colours. Reasons for this remain unclear. Thus, the project scientist (PI), mentored by Einar Uggerud and Arne Karlsson (Chemistry, UiO), will study specific instances of discolouration and paint loss in Oslo objects in collaboration with Streeton, Vila and Kutzke. This involves examining the mechanisms, circumstances and locations of deterioration for copper-carbonate and copper-acetate pigments, their binding medium and varnish layers. The chemical characteristics of the least and most durable paints and their ground layers will be compared with a combination of analytical techniques (e.g., Raman, scanning electron microscopy and gas chromatography). Data will also be gathered from similar painted objects in Copenhagen and Stockholm (among other locations). The aim is to understand the visual impression of green passages, as they once existed, and to contextualise the physical mechanisms of damages via recipe books for paints and varnishes, restoration manuals, antiquarian accounts and early photographs, among other sources.

° *Project (4): exhibition research at KHM* – A social anthropologist (advanced researcher) will research and coordinate a series of KHM exhibitions. Their aim is to facilitate intellectual access to these objects, by situating the collection relative to deeply engrained ideas about Norwegian cultural heritage. In consultation with the project research network, this researcher will concentrate on the resonance of broader issues surrounding the religious and social contexts of these objects, as well as the transmission of ideas about them that have conditioned their current low status within the museum and beyond.

The exhibition coordinator and Frøysaker will arrange two workshops for the project network and a select number of museologists, aiming to develop ideas for presenting this material in KHM exhibitions that are planned to open from late 2015 onwards. From December 2015, a select number of altarpieces will be part of a new root exhibition tentatively called ‘Colonisation’, which will explore colonisation as the tension between expanding systems and the need to tie entities (cultures, bodies, political systems, plant species) around a centre. The altarpieces and cult figures are highly relevant here as they came to Norway as part of expanding mercantile and political systems, but were disinvested of meaning as Protestant religious foundations were established. Furthermore, from 1814 and through the nineteenth century, these objects were simultaneously integrated into museum study collections but yet were separated from indigenous Norwegian works of art. It is therefore pertinent to ask audiences: should these objects sit outside of a Norwegian historical memory today?

From spring 2016, KHM will introduce the ‘Objectarium’, using an examined altarpiece as one of the first case studies. The Objectarium is a new exhibition platform at KHM, which focuses exclusively on objects/collections, and in this case will focus on the materials research undertaken for the ‘After the Black Death’ project. The exhibition will concentrate on how conservators extract information from objects, the concrete and diffuse decisions that challenge conservators, and how these affect larger conceptions of history. This is more than simply putting the technology of conservation on public display. This exhibition will discuss the processes of concealing and revealing that are vital to conservation and the museum institution.

Finally, one of the over-arching topics to be explored in both exhibitions deals with Norwegian/Icelandic objects from this era and notions of ‘low-quality’ in comparison to similar objects in Swedish, Danish, German, Dutch collections. Is this born out in the material (standard of painting, structure, care, use, neglect)? Or is this opinion more a function of their historical context: tied as these objects are to an historical period when Norway was dominated by Denmark. The hypothesis is that their low status is a function of their association with a period in pre-Protestant Norwegian history, which has not been absorbed into Norwegian national ideals.

III. Project organisation, cooperation, project management and dissemination

The project is managed by Frøysaker, with Streeton as principal investigator. Wadum, the Post-Doc conservation scientist and the KHM advanced researcher are project investigators, while a conservator will be hired to provide administrative support. The table below lists project members, vacant positions, affiliations and roles. Those for which funding is sought appear in blue boxes, while those funded by UiO appear in grey.

Project member	Affiliation	Role
UiO – Conservation		
Tine Frøysaker, Professor	Conservation Studies, IAKH	Project manager
Noëlle Streeton, PhD	Conservation Studies, IAKH	Principal investigator / PhD supervisor
Kristin Kausland	Conservation Studies, IAKH	PhD researcher
Vacant position, PhD fellow	Conservation Studies, IAKH	PhD researcher
Vacant position, Administrator	Conservation Studies, IAKH	Administrative support (20%)
UiO – History		
Jón Viðar Sigurðsson, Professor	History, IAKH	Network collaborator
Erling Sandmo, Professor	History, IAKH	Network collaborator
UiO – KHM		
Vacant position, Advanced researcher	Exhibitions, KHM	Project investigator / Exhibition Researcher and Coordinator
Hartmut Kutzke, PhD	Conservation, KHM	Materials scientist
Espen Uleberg	IT, KHM	Senior engineer / Database dissemination
UiO – Chemistry		
Einar Uggerud, Professor	Chemistry, KJM	Mentor to Post-Doctoral fellow
Arne Karlsson, Professor II	Chemistry, KJM	Mentor to Post-Doctoral fellow
Vacant position, Conservation Scientist	Chemistry, KJM	Project investigator / Post-Doc researcher
Partners		
Jørgen Wadum, Professor	Director, CATS, Statens Museum of Kunst, DK / University of Amsterdam	Project investigator / Technical art historian
Aoife Daly, PhD	CATS, Copenhagen	Dendrochronologist
Anna Vila, PhD	CATS, Copenhagen	Conservation scientist (paint analysis)
Jan von Bonsdorff, Professor	History of Art, University of Uppsala	PhD supervisor
Michelle Marincola, Professor	Chairman, Conservation Center of the Institute of Fine Arts, New York University	Network collaborator
European consultants		
Jaap Boon, Professor	University of Amsterdam	Conservation scientist
Jana Sanyova, PhD	IRPA/KIK, Brussels	Conservation scientist
Patrick Dietemann, PhD	Doerner Institute, Munich	Conservation scientist (paint analysis)

Project management

Object-based investigations began in 2011, supported by the Faculty of Humanities, UiO. The funded project will commence in Autumn 2014, to allow for the advertisement of PhD, Post-Doc and KHM researcher positions. It will progress according to the time-plan below, with all financial matters managed by the administration of IAKH (UiO).

	Medieval Forum	Object-based investigations	Meetings/ Conference	KHM	Synthesizing research
2010	Forum				
2011		Object-based investigations			
2012		Object-based investigations			
2013		Object-based investigations			
2014		Object-based investigations	Oslo meeting Task charting	Oslo workshop Task charting	
2015		Object-based investigations	Copenhagen meeting	Copenhagen workshop	Colonisation exhibition (December 2015)
2016		Data interpretation	Uppsala mtg		Objectarium exhibition (Spring 2016) Peer-reviewed publications
2017		Data interpretation	Conference	Database launch	Peer-reviewed publications Conference publication

° *Investigations and data interpretation* – The main responsibilities for object-based data gathering and data management fall to UiO and CATS researchers: Streeton, Kausland, Kutzke, the project scientist, Vila and Daly. This team will continue analyses through 2015, with the aim of thorough examinations of all altarpieces plus c. 10 individual objects. Given the complexity of interpreting analytical data associated with paint, gilding and surface coatings (e.g., varnish, wax, dirt), the final two years of funding will be devoted to data interpretation, in preparation for dissemination. To ensure consistency, interpretations of material data will be overseen by Vila. On her

recommendation, research partners in Amsterdam (Boon), Brussels (Sanyova) and Munich (Dietemann) would be asked to offer assistance as required.

° **Meetings and workshops** – After the official launch work will begin during the first network meeting and exhibitions workshop in Oslo in Autumn 2014. Both will entail task charting, led by Frøysaker and the KHM project investigator, respectively. Further network meetings will be held in Copenhagen and Uppsala for project members. In the case of Marincola, her methodologies and findings in polychrome sculpture in The Cloisters (Metropolitan Museum of Art, New York) are directly relevant. The Copenhagen meeting would be synchronised with the second exhibition workshop devoted to mounting the exhibitions. More frequent meetings between network members would be held via Adobe Connect.

° **Projects 1–3** – PhD research (Project 1) will be co-supervised by Streeton and Jan von Bonsdorff; Project 2 on box-makers will be led by Wadum; and Post-Doc research (Project 3) will be mentored by Uggerud and Karlsson.

° **Project 4** – The KHM project investigator will drive efforts at KHM to create a public face for the project. Exhibitions featuring research results will open in December 2015 and Spring 2016. The various strands would then be synthesized/consolidated in the course of 2016 and prepared for publication in 2017, when articles would be submitted to peer-reviewed publications (see dissemination below). Finally, an international conference, centred on the museum, would be scheduled for 2017, coinciding with the database launch.

Dissemination (synthesizing research)

Findings will be disseminated locally, across Scandinavia and internationally.

° **Local and Scandinavia** – Three network meetings, held in turn in Oslo, Copenhagen and Uppsala, offer a platform for researchers to present provisional results and gain feedback. These will be open to students and colleagues in each respective location. A fourth and final meeting will be an international conference, hosted by the Oslo team in June 2017 (see below). For this, current MA students in Conservation Studies (UiO) will be tasked with public outreach via KHM. In addition, two additional workshops synchronized with the first two network meetings aim to connect network members with museologists and others with a vested interest in the transmission of ideas via museum display. The workshops will be designed to harness ideas about object positioning and didactic materials for the ‘Colonisation’ exhibition (from December 2015) and the ‘Objectarium’ (from Spring 2016).

° **International** – Open access to the research results via the on-line project database is central to the dissemination plan, with clear guidelines to engender respect for materials research and to caution against casual interpretation of scientific data. Ultimately this platform will play a role in confronting the traditional secrecy associated with the discipline of conservation. Furthermore, the two PhD theses, written in English by Kausland and the new PhD candidate (Project 1), will in time be featured on the homepage and made available via a link.

Articles based on joint analytical studies of c. 3 individual objects completed in the first two years by Streeton (PI), the project scientist (PI), Anna Vila and Aoife Daly will be aimed at *Studies in Conservation* and *Zeitschrift für Kunsttechnologie und Konservierung*. Both are peer-reviewed, level 2 and fully international. These will be released gradually, while the results of Project 2 (box-makers) and Project 3 (damaged green paints) should be released as papers following the final year of funding. An article authored by Wadum (PI) and Daly on box-makers is likely to be directed at *Art Matters: International Journal for Technical Art History*, while two distinct articles on green paints, authored by the project scientist (PI), Streeton (PI), Vila and Kutzke, should be submitted to *Studies in Conservation* and either the *Journal of Raman Spectroscopy* or *Analytical Chemistry* (depending on the results). Each of these outlets commands the attention of key user groups, thus ensuring maximum accountability and visibility for the project, the museum and the university.

The exhibition coordinator (PI) will direct the accumulated findings of Project 4 toward the *Journal of Material Culture* and/or *International Journal of Heritage Studies*. At least one article will explore current attitudes to damaged ‘Hanseatic’ objects. These topics will also be the focal point of a conference (June 2017), chaired by Frøysaker, designed to air, celebrate and debate the results of truly interdisciplinary collaboration. Contributions from European and

American scholars aligned with this research area will also be invited. Collected papers with extended essays will be edited by Frøysaker, Streeton and Wadum. This book is intended to represent the culmination of the first stage in the writing of interdisciplinary histories of the late-medieval Oslo collection. It promises to focus attention on the evolution of attitudes to objects imported to Norway, some nearly 600 years ago, while simultaneously showcasing the innovative methodological and practical foundations for object-based research built through this project. It also promises to open a productive but sensitive debate among those concerned with cultural heritage, the history of Norway and the cultural memory of its diverse population that will be sustained as examinations of this large collection continue.

¹ *Painting and Polychrome Sculpture, 1100–1600: Interpretation, Material Histories and Conservation*, KHM (November 2010).

² Nadolny ed. 2006.

³ Eastlake (Dover ed. 1960): 182–214; Merrifield (Dover ed. 1999): ccxciii–cccxi.

⁴ Nineteenth-century enquiries focussed on Jan van Eyck (d. 1441), the reputed inventor of oil painting. See Streeton 2013: Ch. 1.

⁵ Coremans et al. 1953; Streeton 2013: Ch. 2.

⁶ Plahter et al. 2006; Tångeberg 2006.

⁷ The Swedish Hemse crucifix (ca. 1170–1190) provides a *terminus post quem* for oil techniques. See e.g., Tångeberg 2006: 1.

⁸ For the emergence of ‘Technical art history’ as a discipline, see Bomford 2008.

⁹ von Bonsdorff 1993; von Achen 1994: 59–60; Peters and Martens 2005.

¹⁰ Erla Hohler (Emeritus Professor, KHM) has facilitated access to her unpublished catalogue for the KHM late-medieval collection and her source archive. Jan Brendelmo, NIKU, continues to offer his assistance with church records (post-1600).

¹¹ E.g., Cranach Digital Archive, <http://www.lucascranach.org/>

¹² The method relies on measuring the width of consecutive growth rings. Measurements can be carried out on-site with a magnifying glass with an integrated scale, via an innovative non-invasive technique, or in the laboratory. Measurements are then assessed with reference to an extensive database of tree-ring records for Northern Europe. See Daly 2011; Daly and Läänelaid 2012; Bill and Daly 2012; Klein in Wadum and Streeton eds. 2012: 55, 63.

¹³ IAKH awarded another NOK50.000 to Streeton in 2013 to commission Daly to initiate work on ca. 5 objects (Aug.–Dec. 2013).

¹⁴ Kausland’s thesis (due 2015/6) focuses on ‘Lübecker’ works and argues, among other things, for the probability that Bergen-based craftsmen modified altarpieces before they were shipped onward and installed in churches.

¹⁵ Apart from Ringsaker, each altarpiece has been studied and conserved recently at NIKU.

¹⁶ Customs accounts are preserved, for example, in the city of Antwerp’s FelixArchiv and Amsterdam’s Stadsarchief.

¹⁷ von Bonsdorff 1993; Jacobs 1998; Peters and Martens 2005; Wubs-Mrozewicz and Jenks 2013.

Bibliography

Bill, J., Daly, A., ‘The plundering of the ship graves from Oseberg and Gokstad – an example of power politics?’, *Antiquity*, 2012.

Daly, A., ‘Dendro-geography - Mapping the Northern European historic timber trade’ in *Tree-Rings, Art and Archaeology*, ed. Pascale Fraiture, Brussels, 2011: 107–123.

Daly, A., Läänelaid, A., ‘The dendrochronological dating of three paintings in the style of Bosch/Bruegel’, in *On the Trail of Bosch and Bruegel: Four Paintings under Magnification*, ed. E. Hermens, Copenhagen/London, 2012: 47–55.

Coremans, P., et al., *Les Primitifs flamands... 2. L’Agneau mystique au laboratoire: Examen et traitement*, Antwerp, 1953.

Eastlake, C.L., *Methods and Materials of the Great Schools and Masters, Vol. 1*, Dover, Mineola (NY), 1960 (1847–1869).

Engelstad, E., *Senmiddelalderens Kunst i Norge*, Oslo, 1936.

Gundhus, G., ‘Alterskap fra Slagen kirke – tekniske og kunsthistoriske problemstillinger’, i *Universitetets Oldsaksamling Årbok 1975/1976*, Oslo, 1977: 165–173.

Merrifield, M.P., *Medieval and Renaissance Treatises on the Arts of Painting*, 2 vols., Dover, Mineola (NY), 1999. (1849.)

Nadolny, J., ed., with Kollandsrud, K., Sauerberg, M-L., and Frøysaker, T., *Medieval Painting in Northern Europe. Techniques, Analysis, Art History. Studies in Commemoration of the 70th Birthday of Unn Plahter*, London, 2006.

Peeters, N., and Martens, M.P.J., ‘A cutting edge? Woodcarvers and their workshops in Antwerp 1453–1579’, in *Constructing Wooden Images*, eds. C. Van de Velde, H. Beeckman, J. Van Acker and F. Verhaeghe, Brussels, 2005: 75–92.

Plahter, U., Hohler, E.B., Morgan, N.J., Wichstrøm, A., *Painted Altar Frontals of Norway 1250–1350*, 3 volumes, London, 2006.

Streeton, N.L.W., *Beyond the Ghent Altarpiece. Perspectives on the Painting Technique of Jan van Eyck*, London, 2013.

Streeton, N., and Wadum, J., ‘Northern European panel paintings’, in *Conservation of Easel Paintings*, eds. J. Hill Stoner and R. Rushfield, Oxford, 2012: 85–97.

Tångeberg, P., ‘The crucifix from Hemse’, in *Medieval Painting in Northern Europe. Techniques, Analysis, Art History. Studies in Commemoration of the 70th Birthday of Unn Plahter*, ed. J. Nadolny, Archetype, London, 2006: 1–10.

von Achen, H., ‘“Hanseatic Art” in late medieval Bergen. Import or Local production?’ in *Bergen and the German Hansa*, ed. I. Øye, Bergen, 1994: 59–85.

von Bonsdorff, J., *Kunstproduktion und Kunstverbreitung im Ostseeraum des Spätmittelalters*, Helsingfors, Helsinki, 1993.

Wadum, J., and Streeton, N., eds., ‘History and use of panels or other rigid supports for easel paintings’, in *Conservation of Easel Paintings*, eds. J. Hill Stoner and R. Rushfield, Oxford, 2012: 51–115.

Wubs-Mrozewicz, J., and Jenks, S., eds., *The Hanse in Medieval and Early Modern Europe*, Leiden, 2013.