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contents

President's Report

Tamara Lavrencic
National President

While AICCM Council is concentrating on a number of projects, there are three that I think will be of interest to most members.

AICCM Council restructure

At the last meeting of National Council, Publications Officer, Alice Cannon, tabled a paper proposing a restructure of Council with the aim of streamlining the bureaucracy and record-keeping and therefore making it more attractive for members to stand for office.

While we're in the early stages of considering alternative models, there is strong support for reducing the number of meetings, by delegating projects or tasks to Working Groups, which could be geographically or speciality based. Brief progress reports would be forwarded to the Executive at agreed intervals and an annual report presented in person at a full council meeting. At the same meeting the Strategic Plan for the next year would be rolled out and discussed.

AICCM web redesign

Given that the issue of distance will always be a factor within the Australian conservation community, the website is a key consideration and should be able to assist in streamlining our activities.

The current AICCM website utilises an off-the-shelf CMS product, which has been adapted to suit our specific needs. Limitations with the existing system have led us to seek a new design with increased functionality. Alice Cannon and Jenny Dickens have developed a brief for the website with the generous assistance of Crina Belevi (CAN Officer), and this has been sent out to a number of web design companies for quotes.

The aim is to obtain a website that is as automated as possible, to reduce the workload of volunteer committee members and the Secretariat in updating content and membership information. Ideally, the new website will enable AICCM members to manage their personal information more easily and enable secure financial transactions for membership-related fees, publications sales etc via an online payments system.

Professional membership

A review of the Professional Membership category for AICCM was recommended some years ago when concern was raised about the lack of any system for monitoring the currency of skills and knowledge. Christine Ianna developed a discussion paper on this subject after looking at models from the Australian Society of Archivists, the Australian Library and Information Association and the Records Management Association of Australasia. The revised model relies on members demonstrating that they are maintaining their professionalism through a Continuous Professional Development point scheme.

The discussion paper has been modified following consultation with previous professional members and Council and will be circulated to all AICCM members for comment in the near future.

Finally, the preliminary program for the AICCM 2007 National Conference, to be held in Brisbane, is out and looks to be a stimulating event. For anyone who remembers the 1983 conference in Brisbane, be assured, I will not be handling any slide projectors!

from the editorial committee

Our feature article for this issue is from our colleague **Vicki Humphrey** from the British Library with a detailed update on the development of the recently opened British Library Centre for Conservation. This project not only involved the development of the actual physical Centre, but also the review of operations and work practices of the sections occupying the building.

From Tasmania we bring a disturbing report on the downsizing of the Conservation Department at the Queen Victoria Museum and Art Gallery in Launceston, with a special tribute to the work and skills of **John Hay**, frames conservator. The loss of two conservation positions – one third of the Department – is the result of an organisational review, which has seen the loss of substantial numbers of staff across the Museum.

Maria Kubik and **Jocelyn Evans** review the successful workshops held at the CCMC early this year on the thread-by-thread tear repair of paintings, which were presented by Prof Winfried Heiber and Petra Demuth from Germany. In addition there is information about the development of the micro spatulas used in the workshop. These spatulas were developed by **Robin Hodgson** of RH Conservation Engineering specifically for use during the workshops.

The potential dangers of arsenic residues on *keris* daggers is highlighted in **Georgia Harvey**'s technical note. Georgia is a recent graduate of the Masters course at the University of Melbourne and this research was undertaken as part of her thesis research.

Our regular columns are included with words from our President, **Tamara Lavrencic** and news of people and projects around the country. Also included are inserts regarding the National Conference to be held in Brisbane in October. We encourage all members to participate in the Conference, which will be an opportunity to exchange knowledge and information and to catch up with old friends and meet new colleagues. The conference is being held at the refurbished State Library of Queensland, and the new Gallery of Modern Art, which is in the arts precinct will be of interest to members.

Queen Victoria Museum and Art Gallery farewells talented frame-maker

Recent changes at the QVMAG, due to an organisational review by Launceston City Council, have greatly impacted on the Conservation Department, where two positions out of six have been made redundant.

The Paper Conservation Technical Officer and Frames Conservation Technical Officer were the two affected positions, corresponding to our highly skilled colleagues **Tamara Hollister** and **John Hay**.

Tamara Hollister, however, is currently filling the Paper Conservator's position while Jucara Defarias is on maternity leave, so we will be lucky to have Tamara with us for one more year. Tamara's capabilities to fill this higher role demonstrate her great expertise in the area and her understanding of conservation principles.

For now, our best wishes for the future go to John Hay, who has been an invaluable asset for the Museum for the last 13 years. During that time he has become highly skilled in frames conservation and restoration, as well as in frame-making. John has researched and constructed numerous replicas of Tasmanian colonial frames, as well as building an extensive collection of silicone and hydrostone moulds for replicating the ornamentations of two main Tasmanian colonial

John Hay working on the compo ornamentation for a reproduction Hood frame for the portrait of Mrs Wood by Henry Mundy

frame-makers, William Wilson and the Hood Workshop.

During his time at the Museum, John's craftsmanship, as well as his work ethic and understanding of conservation principles, has been remarkable. His training has been on the job, through years of practise and experimentation with gilding, carving, wood-working, moulding and finishing techniques.

John was very passionate about his job, and his perfectionism and attention to detail were outstanding. John's skills are irreplaceable within our conservation staff and have been lost not only to the Museum, but to the whole Tasmanian community. The loss of conservation staff in QVMAG will also impact on the already existing shortage of conservation skills in Tasmania.

On a final note, this loss should also make the conservation community reflect on the importance of craftsmanship skills in conservation, which are not represented in the Australian conservation training, and are possibly not valued or understood by some institutions.

The British Library Centre for Conservation

Vicki Humphrey, Head of Conservation, British Library

On May 16th 2007, the British Library Centre for Conservation (BLCC) was opened, providing Conservation staff and the Sound Archive Technical Services staff with a new purpose-built base from which to operate. The completion of the building has allowed us to bring all Conservation staff and Sound Archive Technical Services staff onto the same site as their colleagues and to co-locate them with the collections for the first time. In addition a BLCC-based programme of professional development events, special interest group events and public tours provides Collection Care[1], Conservation, and the Sound Archive Technical Section with a public profile and a voice for communicating key messages about the Library's stewardship of its collections and about caring for collections generally.

The opening of the BLCC is seen as a milestone in the history of collection care at the Library, yet it is also important to note that the design, construction and move to the BLCC is only part of an ambitious change programme that commenced before construction and still continues now we have moved in. The development of the Centre provided the perfect opportunity to examine all aspects of our operations and to make changes where these would result in benefits to the Library and the staff.

The BLCC and the Library Terrace

The British Library – Background

The British Library was created in 1972 by Act of Parliament. The Act, along with subsequent transfers, brought together the Library of the British Museum, incorporating the Patent Office Library; the National Central Library, the National Lending Library for Science and Technology, India Office Library and Records[2] and the Sound Archive[3].

As noted on the British Library's website[4], the collection includes 150 million items, in most known languages, and a further 3 million items are added to the collection every year. The collections include manuscripts, maps, newspapers, magazines, prints and drawings, music scores, patents, paintings, furniture, sculpture, as well as 8 million stamps and other philatelic items. The Sound Archive keeps sound recordings from 19th-century wax cylinders to the latest CD, DVD and minidisc recordings as well as the machines required to play them and an HMV dog! The sheer scale of the Library is brought home by the statement on the website that if you see 5 items each day, it would take you 80,000 years to see the whole of the collection.

The Library made the move to the new building next to St Pancras Station in 1998. It has a total floor area of over 112,000 sq metres spread over 14 floors – 9 above ground, 5 below. This building, designed by Colin St John Wilson, is the largest public building constructed in the UK in the 20th century and is, from a personal perspective, a real pleasure to work in.

During planning and construction and after delays and rising costs, the building programme for the main Library building was cut to approximately two thirds the size of the original plan. This meant that some staff, and the operations they carried out, remained in buildings on various sites in London. Just over half of the Conservation staff remained in the bindery building at the back of the British Museum. The Library paid rent for this accommodation which was no longer considered to be appropriate for the work being carried out, with a shift away from binding to book conservation. The Sound Archive Technical Services were also inappropriately housed in what had been the offices of a brewery. The building was noisy and was subject to vibration when Tube trains passed beneath it. Both Conservation and Sound Archive staff continued to provide quality services but it was clear that there were many benefits to be realised from bringing these operational areas onto the British Library site at St Pancras.

1 Collection Care is made up of Preservation, Collection Storage and Security, Conservation, Digital Preservation, Conservation Research, Conservation Training and Development and Collection Care Support. There are c. 200 people in Collection Care and 81 people in Conservation.

2 India Office Library and Records contained the entire archives of British India from the foundation of the East India Company in 1600 to Indian independence.

3 The British Institute of Recorded Sound joined the British Library, in 1982, the same year as the India Office. The Sound Archive is internationally recognised with the largest sound collection outside the US.

4 www.bl.uk

The BLCC – A Guided Tour

The contract to build the BLCC was let as a two stage design and build contract and Library staff worked extremely closely with the architects, engineers and builders to ensure that the brief was clear and appropriately specific to our needs. The resulting building is an extension to the main British Library building, but it is an extension that is, in its detailing, designed to both harmonise and stand on its own. The architects, Long and Kentish, selected bricks that matched the main building, but have also clad the building in timber that over time will age to a silvery grey in contrast to the red brick.

The design has also provided an extension to the outside terrace on the first floor level, which leads to the main entrance to the BLCC and provides a resource for functions and outdoor events in the summer months. The two buildings are also connected at the other two lower levels of the BLCC, through a secure corridor on the middle floor allowing for safe passage of collection items and through the now covered main loading bay of the Library at lower ground floor level.

The BLCC has been described as an upside down building with the largest floor area on the top floor. This is due to the requirement for natural north light all year round for the Conservation studios. This is provided by roof lights in a classic saw tooth roof, which spans the large open plan conservation studios on the top floor of the building. There are three studios in this space, with two teams in each studio.

BLCC Conservation studio

Each studio has 8 generously proportioned U-shaped benches, which have light boxes, network connections and telephone points built into the smaller section of the U-shape, and which provide the conservators with a reasonably flexible working space. A key feature of the benches is that the air conditioning for the large studio area is provided through grills built into the ends of the benches. This provides air at the level it is needed and dispenses with the need for overhead ducting that would interrupt the all-important north light.

There is a shared wet area running the full length of the building on the western side. This area is equipped for aqueous treatments including washing, deacidification and calcium phytate treatment for iron gall inks. In addition to the drying racks in this space, we intend to hang *karibari* boards and similar drying systems on the blank western wall. Positive pressure from the main studios helps to prevent moisture from the wet area moving into the studios. This reduces the load on the air conditioning plant and contributes to a reduction in running costs. There is separate provision for leafcasting – this has been separated due to the need for a compressor to run the machine and as for the wet area, to aid in reducing the load on the air-conditioning plant.

There are two dirty areas adjacent to the studios; an area for leather paring is separated off by a partition at one end of the wet area and at the other end, an area is set aside to be used for board slotting after the purchase of a board slotting machine.

Studios 2 and 3

Two other studio spaces, an office and the Foyle Visitor and Learning Centre make up the remainder of the facilities on the top floor. The first of the studios is the base for the Book Care team who undertake a range of work, including fast turn around treatments such as minor repairs to maps and bindings. This room doubles as a project room and workshop space and has been designed to be flexible. The work benches in this area are mobile and height-adjustable, so that they can be rearranged to suit project working, production-line working, workshops, training programmes and masterclasses. Of necessity this room can be isolated from the others for security reasons.

The other studio is specifically designed and fitted out for finishing. At the British Library gold leaf is still used on many bindings. Because of the use of finishing stoves to heat the tools, this area is self-contained and the heat cannot affect the main conservation environment.

Paccar Finishing Studio with view to Channel tunnel Rail Link Development

Looking through the Exhibition to the Terrace and the Library

The Foyle Visitor and Education Suite[5], is made up of a 60 seat seminar room with AV equipment and an exhibition and entry lobby. Visitors to the Library can access the exhibition, *Conservation Uncovered*, by crossing over the terrace from the main building. The exhibition delivers key messages about the work of the conservators and audiovisual archivists to a non-professional target audience. The conservation component of the exhibition looks at the materials that go to make up books and some of the factors that lead to their deterioration, under attractor headings such as *A Meal in Waiting* (biodeterioration) and *The Usual Suspects* (environmental factors). A feature of the exhibition is an interactive whereby the visitor can gain some insight into the decision-making processes involved in conservation and the implications of the decisions made. There is also a case study of the treatment of one book, supported by videos of the conservators carrying out specific processes. Drawers containing tools and materials used by conservators, as well as text provide supporting information. Videos of a number of conservation treatments such as the treatment of the Diamond Sutra[6] and Mercator's Atlas[7] are also showing. The Sound Archive exhibit features various historic sound systems, as well as an interactive that takes the visitor through the restoration of a piece of audio as a 'case study'. The listener is able to experience the sound in its 'warts and all' form and as a final 'restored' piece or at stages along the way.

5 Sponsored by the Foyle Foundation.

6 The Diamond Sutra is the earliest example of block printing to bear a date: 'the 13th of the fourth moon of the ninth year of Xiantong' (i.e. 11 May, 868). It was was found in a cave in 1907 by the archaeologist Sir Marc Aurel Stein in north-west China. It had been hidden near Dunhuang on the Silk Road, with thousands of manuscripts and printed items. To see the Diamond Sutra online go to http://www.bl.uk/onlinegallery/ttp/ttpbooks.html. The video can also be seen online at http://www.bl.uk/onlinegallery/whatson/blcc/videos.html

7 This atlas was put together in the early 1570s by the Flemish cartographer Gerardus Mercator, perhaps the best-known mapmaker of all time. The Atlas has recently been conserved by BL conservators. (http://www.bl.uk/about/collectioncare/new.html#conservation) The video can also be seen online at http://www.bl.uk/onlinegallery/whatson/blcc/videos.html For more information about the Atlas see http://www.bl.uk/onlinegallery/themes/mapsandviews/mercator.html

On the next floor down is the conservation materials store. It is an ergonomically designed store that will eventually house all conservation materials. The stores are being brought together from different sites and will be managed with a centralised stock control system that is integrated with the Oracle purchasing systems already in use at the Library. This system allows for much more immediate reporting, for easy access to check stock levels and to issue items from the Stores.

Opposite the materials store is the area where phase boxes are made – labelled, creased and cut in one continuous operation using one of the British Library's three precision cutting machines that are supported by computer aided design software. The machine is also used to cut mounts for exhibition and storage and can be used to cut Plastazote inserts for storage boxes. Another machine will be moved to this room upon completion of a boxing programme for the collection moves associated with the construction of an additional storage building at the Library's other site in Boston Spa near York.

The Solvent Treatment Room has two built-in, externally-ventilated fume cupboards. One is reserved for non-aqueous deacidification and the other for all other solvent treatments. Across the corridor is the Examination Room, equipped with a Konica-Minolta spectrophotometer, Leitz MZ95 binocular microscope with a 9.5:1 zoom lens and a Multi-Spectral Imaging System (MuSIS) which allows the user to record an image of an object at 32 different wavelengths, from the violet to the near infra-red. Further training in the use of, and interpretation of results of the images from these pieces of equipment will assist all conservators in understanding more about the levels of deterioration of the items they are examining. The Leitz microscope and the MuSIS equipment have been used to examine the parchment leaves of the Codex Sinaiticus[8] and are important tools in our assessment of calcium phytate treatments.

8 Codex Sinaiticus was produced in the middle of the fourth century and is one of the two earliest Christian Bibles. An ambitious international project encompassing four strands: conservation, digitisation, transcription and scholarly commentary aims to make the Codex available for a worldwide audience. http://www.bl.uk/about/collectioncare/new.html#codex.

A strong room with an Inergen fire suppression system provides safe storage for rare and valuable items awaiting conservation treatment. This is adjacent to the secure link corridor leading to the main building and opposite a workshop equipped with knife sharpening equipment and wood and metal working tools.

The British Library's Loans Registrar has much needed facilities within the BLCC. On the middle floor the Loans Marshalling Room is an area for assembling items going out on, and returning from external loan and items being loaned to the Library. This area is also protected by an Inergen fire suppression system and is conveniently located near the box making and mount cutting facilities. The Loans staff will also make use of the Quarantine Room located just outside the building, opening onto the loading bay. This room is equipped to deal with insect and mould infestations and has examination areas, a chest freezer, a Veloxy system9, a vacuum packer, a down draft workstation and a small fume cabinet. These facilities will also be accessible to conservators and preservation staff involved in Integrated Pest Management and salvage operations.

The Sound Archive technical facilities occupy the lower floor of the new building. The recording studios and transfer studios are designed for state-of-the-art recording, preservation transfer, re-mastering, digitisation, and access services. There are ten transfer studios, one recording studio, a small workshop, and a laboratory. The studios *float* on thick layers of rubber that prevent vibration and deaden sound and are a vast improvement on the previous accommodation. The Sound Archive have identified the main benefits of their move to the BLCC as having the appropriate audiovisual equipment and acoustic environment to undertake work to an archival standard across their whole range of activities while also increasing throughput of work and improving on-site and remote access to BL audio collections.

The Broader View – BLCC+

The design and construction of the new building provided a perfect opportunity to undertake a much needed review of the operations and work practices of the sections occupying the building. This was especially the case for Conservation which is made up of conservators and binders from the component parts of the British Library, as well as new recruits from all over Europe and beyond. The different practices and approaches of the different studios were clearly in evidence when I joined the Library as Head of Conservation in July 2003. My brief was very much focussed on a change agenda, but it is vital to understand what you are changing before you start that process. To that end, I began to look at the skills and knowledge of the staff, the treatments being carried out, the management practices within Conservation and the administrative framework in which we operated. In early 2004, when the BLCC Senior User Team[10] was set up, the work that I and my colleagues were doing to effect change was incorporated into a complex project plan which includes 32 workstreams – three common to Conservation and the Sound Archive, 23 focussed on a considerable change agenda in Conservation and the remaining nine meeting the needs of the Sound Archive. Only one of these workstreams was design development for the building.

The workstreams included Organisational Design and Development, Workflow and Logistics (both physical and virtual), Performance Management Implementation, Bidding, Estimating and Programming, Disability Friendliness, Conservation Imaging, Quarantine Process, Equipment and Machinery, Equipment Planned Maintenance, Facilities Management Services, Environmental Practices, Health and Safety, Moves Planning, IT and Technology Infrastructure.

Not all the workstreams were exclusive to the project. Performance Management Implementation, for example, was Library-wide but was included on the project plan in recognition of its importance as a management tool. Almost all workstreams involved layers of activity; many led to the development of other workstreams during the early phases of the project and almost all were, and continue to be, interdependent with others.

Documentation, Treatments, Skills and Research

The following overview of some of the key Conservation workstreams gives some sense of how fundamental the work has been to bringing about change but also emphasises the scope of what we have been involved in.

Documentation of conservation work was carried out in a variety of ways. There was no consistent system and in some areas there was little or no documentation that was readily accessible after the treatment had been completed. Information about what items were treated and the numbers of items treated was kept on two different databases, but no-one in Conservation had direct access to either of these. Nor was there any link between the databases and the

9 VELOXY® (VEry Low OXYgen) is an anoxic system developed as an outcome of the EU funded project, SAVE ART. http://www.heritage.xtd.pl/pdf/full_gialdi.pdf

10 The Senior User Team is made up of the BLCC Change Manager, the Project Sponsor, the Heads of Conservation, Conservation Research, of Conservation Training and Development, Book Conservation, of Technical Services, Sound Archive, of Collection Care Support and two Book Conservation Team Leaders. These people have been assisted throughout with the hard work of a great many other staff. The Head of Collection Care and the Director of the Sound Archive have been involved throughout the project, have been on the Project Board and were founder members of the Senior User Team and have steered and championed the project throughout. The Head of Collection Care, Helen Shenton, now also heads up the Project Board and deserves special mention for her determination to see the Centre built and for her vision of what we could achieve.

paper-based treatment records which were in at least 5 different formats. The Preservation section held records of work done by external contractors and while these were well maintained, their database was overstretched. The Preservation and Conservation Management System (PCMS) was developed to provide a single accessible system. Development work commenced in February 2005 and the system went live in July 2005 (Preservation) and September 2005 (Conservation). The PCMS system is linked to the online catalogue and was adapted for our purposes from the same Aleph software package. Because it is designed as a Library cataloguing and purchasing package, we use the cataloguing module for treatment records in a series of especially designed templates and the acquisitions module for tracking work against programmes timetables and budgets – £UK for Preservation and hours for Conservation. The system has not quite lived up to expectations on the reporting side but work is ongoing to improve the quality of reports.

The development of the PCMS led to a fairly major piece of work to locate and identify the Legacy Treatment Records, i.e. all records from before PCMS. It was clear that entering all old conservation records on the PCMS was not feasible but we required a mechanism for identifying what records we had and to ensure they could be located easily by conservators outside the team that had generated them – previously this had not been possible other than by verbal requests and this clearly required knowledge that such records might exist. With the generous support of the Corporate Information Management Unit and the internal IT section, databases were developed to record details about the identification and location of all conservation records and of all conservation images.

In order to gather information on the treatments that were being carried out at the British Library and to assist in gauging the reasons for selecting these treatments, the Treatment Review was set up in 2004. The initial study was used to sample the work of conservators in the BL and in similar organisations around the world[11]. It was gratifying to note that treatments carried out at the British Library are consistent with the range of treatments being carried out in comparable organisations and that some of the uncertainties about adopting new treatments, e.g. the calcium phytate treatment, were shared by a number of respondents. The initial study lead onto a number of sub-projects, including an investigation and pilot study of phytate treatments, an investigation of board slotting and a feasibility study on the use of cyclododecane for the fixing inks.

Rolling out the practical outcomes of the Treatment Review is closely tied to the Skills Audit that was conducted by Catherine Atkinson, Head of Conservation Training and Development. In consultation with their managers, each staff member rated their skills and knowledge of, and ability to apply conservation ethics, project management skills, a range of conservation treatments, conservation science and IT skills. This has lead to a skills and knowledge profile for each team and will contribute to a prioritised skills development programme for the whole Conservation section. It identifies development needs but also identifies those within the section that can provide training and mentoring to their colleagues.

In 2004 Catherine Atkinson published the results of a study into the need for book conservation in the UK.[12] This study found that the provision for specific book conservation training was lagging behind the present and projected future demand for book conservators. At the British Library we felt we were in a unique position – with a large Conservation section with considerable practical experience in book and paper conservation – to contribute to the training of the conservators of the future.

Our first Heritage Lottery Fund (HLF) funded book conservation intern commenced at the Library in November 2006 and is working with us for a year. Conservation and the Sound Archive will host other internships of varying duration in the future. In addition the first Foundation Degree[13] in Book Conservation is being offered by Camberwell College of Arts, part of the University of Arts, London and will commence in 2007 with the British Library as an industry partner. We intend to monitor the success of these initiatives and look at the feasibility of partnering in the development of other training programmes including MAs and fellowships and broadening the scope to include areas such as preservation and digital preservation.

Research also features on the BLCC Project plan. Conservation research at the British Library was given a considerable boost with funding from the Andrew Mellon Foundation for two collaborative research projects[14] administered by the British Library. The first is to assess copies of the same books held in different libraries, and to relate their condition

11 An internal questionnaire provided the mechanism for collecting data on the treatments being carried out. In the interview with each conservator, their colleagues on the project team also sought to explore the reasons why the conservation staff used those treatments. In parallel, an external questionnaire collected information from across the world. An internal report has been prepared and a report bringing together all aspects of the review is currently in progress.

12 http://www.bl.uk/about/collectioncare/pdf/webconservation.pdf

13 Foundation Degrees were introduced by the Department for Education and Skills (DfES) in 2000 to provide graduates who are needed within the labour market to address shortages in particular skills. Foundation Degrees also aim to contribute to widening participation and lifelong learning by encouraging participation by learners who may not previously have considered studying for a higher level qualification.

14 The partners in the projects are the British Library, the National Libraries of Wales and Scotland, Oxford and Cambridge University Libraries, the library of Trinity College Dublin, The National Archives (Kew) and the National Archives of Scotland. Academic partners are the Centre for Sustainable Heritage at University College London and the Department of Pure and Applied Chemistry at the University of Strathclyde. Velson Horie has been employed specifically to work on these projects. See also http://www.bl.uk/about/collectioncare/new.html#applied.

to differences in their storage environments, and the other to analyse the volatile organic compounds emitted by books and to relate them to the degree and mechanism of paper degradation. Dr Barry Knight, Head of Conservation Research also represents the Library on a number of EU funded collaborative projects. The Library has deliberately committed to collaborative partnerships rather than setting up ambitious research programmes on its own. This strategy gives us access to expertise and equipment and allows for involvement in wide ranging projects.

Behind the Scenes

Another vital workstream in the project plan is the development of the public programmes that have been an integral part of the planning, informing the design of the building from the beginning. Designed to raise awareness of the behind the scenes work that takes place at the Library, these programmes will also strengthen our networks in the professional communities to which we belong.

Tours and events for non-professional audiences including behind the scenes tours, advisory days to assist people in caring for their own collections and demonstrations for older students and non-professional enthusiasts will commence in the autumn of 2007.

Conservation will host, run and collaborate in the presentation of workshops, seminars and masterclasses. We recognise also that this will provide greater opportunities for the improved professional networking of our own staff. In the case of the Sound Archive, the professional programmes build on their already established and highly regarded training.

A Bright Future

The British Library Centre for Conservation and the activities that take place within it are explicitly mentioned in the Library's strategy for 2005-8[15] and it is extremely gratifying to see the work of Conservation, Collection Care and the Sound Archive featured in this document. The support of so many areas of the Library in the work of planning, funding, building and moving into the BLCC, clearly demonstrates the solid commitment of the British Library to the future of Conservation and Sound Archive activities.

It must also be said that the project was a real demonstration of the power of team work, involving people within the Library and from outside. This building, the first capital project at the Library after the main St Pancras building, was delivered on time and on budget (£13.25 million) and could not have been built without the generous support of Heritage Lottery Fund and a number of Trusts, Foundations and individuals[16]. Without the hard work of the conservators and Sound Archive staff, we would not have managed a move so smoothly and be operational – with some glitches – within a month of the first staff unpacking their tools and equipment.

Personally this has been an extraordinary experience for me. I recall delivering a paper at the AICCM Book and Paper Group meeting in Melbourne, called *The Juggling Act*, in which I spoke about the range of things conservators do that their professional training makes no provision for. No course in conservation could have prepared me for this last 3 ½ years and I am very glad that that is the case. I have learned so much from my experiences and from my colleagues and I have done so in wonderful surroundings. But I would not have been ready for this without the steps on the way and the interaction I have had with colleagues in the UK and Australia.

Now the BLCC is built and we have moved in, its success will depend on the work carried out and the quality of services provided by the teams in the building and our commitment to review and evaluate the work we do, in order to continue to be meeting the needs of the Library and its readers. There is still hard work to be done but I am confident that we can achieve what we set out to do.
I invite you all to visit and see how we are doing.

15 Strategic Priority 4 in Redefining The Library: The British Library's Strategy 2005 – 2008 deals with the work we do to 'grow and manage the national collection' http://www.bl.uk/about/strategic/pdf/blstrategy20052008.pdf, p. 17

16 For a full list of donors please visit http://www.bl.uk/onlinegallery/whatson/blcc/donors.html

People & Projects

ACT

Australian War Memorial

The conservation profession and the AWM gained some media exposure in the April edition of *Materials Monthly* with articles covering research into ultrafast laser cleaning by ANU and its partners, an overview of the work by AWM conservation section, and **Eileen Proctor**'s research into the properties of modern sterling silver alloys as part of her BA in silversmithy. **Alison Wain** has been compiling a 10 year preservation plan for the Memorial as well as progressing the purchase of a Lynton Lasers Compact Phoenix laser cleaning unit which we hope will arrive around June.

Preparation of large technology objects for the new Post 1945 galleries is progressing well, with **Lee Davies**

and **David Gordon** putting the finishing touches to the various parts of HMAS *Brisbane* that will be displayed outdoors. **Andrew Schroeder** and **Dean Willis** are overhauling a Land Rover FFR (Fitted For Radio) for use in the Memorial's operating vehicle program. **Jamie Croker** finished preparing the Meteor aircraft for display and is working through a tender process for conservation and restoration firms to undertake large technology work for the Memorial. **Andrew Pearce** has just attended the *Mutual Concerns of Air and Space Museums Conference* in San Diego where he presented a paper on the deterioration of doped aircraft fabric and conducted training sessions on the conservation of large technology along with Chris Knapp from the Imperial War Museum, Duxford. **John Kemister** is currently on long service leave.

The Textile and Objects Labs are conserving items for 1917 commemoration exhibition and for Post 1945 displays. **Bridie Kirkpatrick** is treating one of Lawrence of Arabia's *agals* (head pieces), which came to the War Memorial via the wife of Lawrence's chauffeur. It will be on display later this year in an exhibition entitled *Lawrence of Arabia and the Light Horse*. Eileen Procter is preparing objects for display in the new Post 1945 Conflicts galleries. **Megan Jordan-Jones** has been repairing an 1830's scrimshawed bullock horn and preparing a taxidermied pigeon for display, while **George Bailey** has been working on a German ersatz tree with a periscope used for observation. We welcome **Ilaria Poli** who has been snaffled from the paintings lab to work in the objects lab surveying and rehousing new acquisitions.

The Photo Development Department has continued its conservation of WWI glass negatives. Colour transparencies being treated for mould and long-term preservation are being de-mounted, treated and stored in archival envelopes. The colour transparency work is part of the Memorial's current post 1945 project. **Ian Fulton** has taken on the painstaking project involving treating deteriorated flexible negatives, which requires removing each layer of the negative and attaching the image to a new piece of film.

The Painted Surfaces Lab is treating George Lambert paintings for the NGA's George Lambert retrospective exhibition and a number of paintings for the 1917 commemoration exhibition.

The Paper Lab is looking more spacious since **Helen Butler** left on long service leave and **Gajendra Rawat** moved to Brisbane to join the Conservation Lab at the State Library of Queensland. Our best wishes go with Gajendra and family for a happy, healthy and fulfilling resettlement north of the border. Helen will be away until mid-December. Sophie and Bernard are manning the fort with help from **Kathy Henderson** who has joined us as a volunteer. The exhibition, *George Lambert: Gallipoli & Palestine Landscapes* has recently opened; Sophie and Gajendra not only prepared the works on paper for the exhibition but they have also ventured into the blogosphere with entries on the exhibition's blog (see http://blog.awm.gov.au/lambert/).

NEW SOUTH WALES

Art Gallery of NSW

Carolyn Murphy has been appointed to a full time position in paper conservation and is presently preparing works for a 20th century British watercolour exhibition for July. Carolyn and **Elizabeth Hadlow** - who replaced **Rose Peel** during her long service leave - also prepared prints for the exhibition, *Australian Engravings and Etchings from 1880s to 1930s*. Carolyn and **Paula Dredge** have been working with Registration to develop the use of the Vernon Collection Database for condition and treatment reporting and as a management tool for the outward loan and exhibition programs. As part of this project, information relating to the works on paper collection such as watermarks and additional labels and inscriptions uncovered during treatment, currently documented only in hard copy conservation files, will soon be added to the database. Rose has been preparing some collection works for the Islam exhibition and is working with **Sophia Elze**, a German paper conservation student from the Cologne Institute for Conservation Sciences who is an intern until September when she will move to the NGA.

Stewart Laidler completed the restoration of *Requiescat* by Briton Rivière and at the time of writing, is eagerly awaiting the arrival of four large artworks by Anselm Kiefer from the White Cube Gallery in London. Due to their size, these paintings, arriving by ship in containers, are in three sections and they will be bolted together. They will feature in an exhibition of Kiefer's latest works and will complement a recent acquisition titled *Von den Verlorenen gerührt, die der Glaube nicht trug, erwachen die Trommeln im Fluss 2004*, which comprises two sets of concrete steps weighing over three tonnes which are attached through the front of the work and appear to defy gravity . Its installation was another remarkable achievement by the installation crew. Paula has recently returned from maternity leave to complete the treatment of the painting, *Boar Hunt,* by the workshop of Frans Snyders, circa 1650s. Many weeks have been spent removing a tree painted across the upper right in the 19th century to obscure a dog leaping into the air. It is hoped in the next few months that a student from Forensic Science at University of Technology Sydney will join us to undertake research into the discolouration of the smalt pigment in the sky of the painting. **Kristel Smits** is managing the loans program for paintings. Assisting her with the preparation of loans such as the George Lambert Retrospective is **Beth McCarthy** who is also working two days a week on Furnishing Loans for government departments.

Malgorzata Sawicki is coordinating several projects. After presenting a poster on the frame for Monet's *Port Goulphar, Belle-Ile* painting at the IIC Congress in Munich in 2006, Malgorzata is preparing a presentation titled *Tendency in Aging Behaviour of Surfaces Gilded Using Selected Synthetic Polymers* at the ICOM-CC Interim Meeting of three Working Groups (Textiles, Leather, and Wood, Furniture & Lacquer) in Krakow, Poland, in May. Sophia has been introduced to the frame conservation field by preparing frames for the watercolour exhibition. For ten months **Basia Dabrowa** has removed heavy bronze paint from the large frame for the painting *Rorke's Drift* by Alfonse de Neuville and consolidated the cracked and flaking parts. In coordination with Paula, Basia is now working on the *Boar Hunt* frame. This project is sponsored by Banque Nationale de Paris (BNP). After making several reproduction frames for the coming British watercolour exhibition, **David Butler** has returned to the large format with a challenging project for *Requiescat,* 1888. The design will be based on original frames for Rivière paintings housed in the Tate collection. **Paul Solly** has successfully finished cataloguing and making replicas of the 500-plus ornament moulds from the S. A. Parker Framers workshop. With funds kindly provided by Friends of Conservation, all originals have been professionally photographed and will be returned to Russell Parker.

The Friends of Conservation recently bought a Compact Phoenix Conservation laser System from Lynton Lasers Ltd. in the UK with a standard 2.5 W handpiece [approx. 100mJ@25Hz - 250mJ@10Hz]@1064nm and one 532 nm attachment. Margaret, Basia, **Donna Hinton** and **Victoria Bramwell-Davis** have started a challenging research project, investigating laser cleaning on varied gilded surfaces. Several objects have been selected for the trials based on gilding types, surface coatings, deterioration and soiling. Currently, all the chosen objects are analysed with the stereo-microscope, the polarised microscope with a UV attachment, and the FTIR, in order to establish the components of the gilding layers prior to carrying out laser cleaning treatments. The outcome of these tests and collected scientific data will hopefully be ready to be presented at the ICOM-CC 15th Triennial Meeting in Delhi in September 2008.

Kerry Head is treating bronze and plaster sculptures for the Bertrand Mackennal exhibition opening in August. She has removed some old, deteriorated restorations, replacing them with more sympathetic materials. She is also treating corrosion to improve their stability and appearance. Victoria is treating Persian ceramics, which will be displayed concurrently with the Islamic Art exhibition. The main difficulty has been the removal of old staple repairs and related corrosion products. **Matt Cox** completed a two-month internship with the conservation Department at the Islamic Arts Museum, Malaysia. The internship is the first part of a professional exchange between the two institutions, partly sponsored under the Australia Malaysia Institute's Cultural Understandings Program. The internship provided a great learning experience and platform for cultural and professional cooperation coinciding with the imminent exhibition, *The Arts of Islam: Islamic Treasures from the Nasser D. Khalili Collection.*

Australian National Maritime Museum

Sue Frost has been preparing textile objects for changeover displays in some of the ANMM core exhibitions such as *20th Century Passengers* and *Paddlers* - part of the Voyages display in the Watermarks gallery. She is also working on improvements to the textile storage areas. Overall the textile storage project is not progressing quickly; achievements depend greatly on help by volunteers and at certain times, contractors. A compactus unit is being converted to incorporate rolled and hanging textile storage. Currently volunteers are assisting with packing the swimming costume and hat collection, which involves making trays, Dacron-filled par silk sausages, and internal ethafoam hat supports.

Jonathan London is currently working on filling vacancies for Object Conservator positions. Interviews for these will be scheduled soon. In addition he has been seeking quotes for the storage of four outsized paintings and liaising with the Preventive Conservator and Building Services regarding the development of new specifications for a revised pest control contract. Jonathan is also involved with the National Collections Preservation Committee, which consists of Heads of Conservation from all the National collecting institutions:

Ian Batterham	National Archives of Australia (chair)
Eric Archer	National Museum of Australia
Debbie Ward	National Gallery of Australia
Ree Kent	Old Parliament House
Barbara Reeve	Australian War Memorial
Jennifer Lloyd	National Library of Australia
Jonathan London	Australian National Maritime Museum
Kylie Scroope	Parliament House

Meetings are scheduled quarterly with occasional extra meetings to discuss particular topics.

Daniel Wardrop has been preparing for the looming cleaning of *Spirit of Australia* (a world record holding speed boat) and is working on objects for forthcoming exhibition changeovers. One object of particular interest to be loaned to the Historic Houses Trust is an 18th century ship model carved in intricate detail from mutton bones by French prisoners of war. As part of the Maritimes Museums of Australia Projects Support Scheme (MMAPSS), **Caroline Whitley** is helping to train intern, Donna Abbati from the

Port Kembla Heritage Park. As a long term volunteer at her regional museum, she has received a grant to work with us for 2 weeks, learning a variety of registration and paper/photograph/textiles conservation skills. **Kathryn Yeates** has completed work on the *Saltwater* bark painting collection for its transport to and exhibition at the Lake Macquarie City Art Gallery. Condition reporting over 70 barks was an excellent opportunity to appreciate the diversity of the works. The *Saltwater* collection will be on display at the ANMM later this year and the opportunity is being taken to conduct maintenance on the support frames.

ICS

We welcome **Skye Firth** as permanent staff at ICS working in the Textiles section, **Karina Acton** as our Senior Objects conservator, and **Rachael Crompton** as project coordinator. Skye joins us after having completed her Masters at the University of Melbourne, Karina from the National Maritime Museum and before that Heritage Victoria, and Rachael from the Museum of London via various appointments. Skye had a baptism of fire along with **Miriam Wormleaton**, conserving a massive textile wall hanging at the University of Newcastle. Of great assistance to them was ICS's purchase of a new wash table with all the bells and whistles. **Arek Werstak** has taken on the role of Senior Sculpture Conservator. He has been busy ensuring an important mosaic in the apse of Sacred Heart Church, Darlinghurst stays in place while the entire east end of the church is relocated. Meanwhile **Nicole Rowney** has undertaken further work on the original wallpaper in situ at the newly opened terrace at Susannah Place, one of the Historic Houses Trust properties, and she is about to assess the wallpaper in an historic homestead outside of Hobart.

On Antarctic matters, the Deep South team, **Chris Calnan** and **Fiona Cahill** (both from the UK) and **Emily Fryer** and **Phillipa Durkin** (both from NZ), are doing well with the last rays of light now vanished and the onset of winter and 24 hours of darkness to contend with. They are continuing the treatment program of the artifacts from Shackleton's hut at Cape Royds, begun last year by **Sarah Clayton**, **Ainslie Greiner** and **Nicola Dunn**. **Julian Bickersteth** spent most of last November rearranging the objects back to their original 1907 configuration at the hut. The next round of conservator appointments covering the two periods of August 2007 to February 2008 and February to August 2008 was completed in March.

Fiona Tennant has submitted her thesis on the issue of access to remote sites, which concentrates on the Antarctic huts, for her Masters in Museum Studies at the University of Leicester. The broader issue of access to collections continues to challenge the ICS team. ICS has two major projects underway in this area, one being the review of the National Museum's website, the other an assessment of the capability of the cultural and creative sector in the digital environment for DCITA.

Anna Diakowska-Czarnota attended the conference in May organized by ICOM-Poland and ICOM-CC at the National Museum of Poland in Krakow on the conservation of historic upholstery works. In April, **David West** attended the AIC 35th Annual Meeting in Richmond, Virginia. Armed with a long list of questions from his colleagues, he sought answers in talks at the conference, *Fakes, Forgeries, and Fabrications*. He took part in a Board meeting of APT (Association for Preservation Technology International), of which David is a director and co-convenor of the APT Australia chapter. Also in April, Julian Bickersteth was part of the AusHeritage delegation to India for a joint symposium with INTACH, the Indian National Trust for Art and Cultural Heritage.

Powerhouse Museum

The opening of the Discovery Centre at Castle Hill, our off site collection storage facility, was a great success with 8,300 visitors. The stores are now open to the public (one weekend per month) and group bookings are available. The whole department was involved in the opening of the Discovery Centre and we were delighted with the public's response. There are very few museums in the Hills District or Western Sydney, so it is significant to be able to offer the opportunity to view a large part of our collection to local people. The display store showcases all sorts of huge objects, including seven planes suspended from the ceiling. Upstairs, the self-guided display area houses sixty-two three-drawer units which contain hundreds of objects. There are also shelf-display units holding many large objects and free standing objects for viewing. There is also a grand showcase displaying dozens of Doulton ceramics. **Gosia Dudek** prepared these objects for display. Eighteen drawers and three display cases are dedicated to preservation issues and demonstrate some simple preventive methods.

Dave Rockell has taken 3 months leave, and **Skye Mitchell** is backfilling his position. She and her team (**Analiese Treacy**, **Lyn Sisopha**, **Rebecca Main)** are working on a new project called TAM (Total Asset Management). This is a long-term project inspecting the Museum's A and B category objects and rehousing and preserving them if required. One of the first projects is the cataloguing, rehousing, scanning and cleaning of thousands of glass plate negatives from the valuable Clyde collection. **Kristen Clarke** has left the photography team but a new photographer **Kate Pollard** has joined us. She and **Chris Brothers** are also part of the TAM project.
In March, **Mary Gissing** and Gosia Dudek dismantled *The Great Wall of China* exhibition and Mary was courier

of the exhibition to Melbourne. 650 handmade objects were installed by Gosia and **Bronwen Griffin** for an exhibition, *Smart Works*. Harbour bridge objects were put in place at the Observatory and at the Discovery Centre to mark the 75th anniversary, and *Guan Wei* has recently been taken down. **Suzanne Chee** installed the annual Student Fashion exhibition and she is currently working on *Fashion from Fleece: 200 years of Australian wool in fashion*. **Nadia de Wachter** installed an Indian elephant carved from a block of graphite, one of the Museum's iconic objects, in a display adjacent to *Zoe's House,* a new interactive play space for children. An 1860's German zoological board game accompanies the elephant figure and is part of the Museum's online interactive play for children. Currently, Bronwen Griffin is preparing four pianos and an electric organ for concert use. Work continues with our inward and outward loans. Nadia prepared two loans for Old Parliament House, *Scarred and Strengthened: Australians in the Great Depression,* and objects for an exhibition in the Australian Prime Ministers' Centre. **Kate Chidlow** dismantled the *Works Wonders* exhibition in Orange in March and Mary Gissing installed it in Port Macquarie.

Annual work on locomotive 3830 (including non-destructive testing of axles and firebox, internal inspection by boiler inspector and steam test) was completed and the locomotive successfully returned to traffic for the Opening of Steam Season at the Thirlmere Festival of Steam in early March. It also successfully ran a trip to Moss Vale via the Illawarra Escarpment in late March. Mary Gissing, **Tim Morris** and Chris Brothers attended the annual *Steamfest* event in Maitland. The steam engine 3830 was there along with a regional services tent displaying many of our steam models. The event is getting bigger each year, with 3,800 visitors this year. Mary and Tim gave preservation talks to the public.

State Library of New South Wales

In the culmination of a major project that has been four years in the planning stage, the Library is in the process of relocating low use collections from an existing off-site store to a new, bigger and better one. The new facility is owned and managed by an external company, but Preservation staff have provided input into issues such as environment and disaster planning. We have also trained external staff in handling and disaster response. During the relocation, Preservation staff are on hand each day to oversee cleaning of collection material before it is moved and to carry out any urgently needed collection care such as repackaging. When the relocation is complete we will continue to monitor environmental parameters at the new storage facility.

Tegan Anthes has been conducting disaster awareness training sessions for SLNSW staff and external contractors. The SLNSW session is "refresher" training that outlines the necessary procedures required in the event of a disaster - major or minor. It aims to highlight steps now in place and the actions that follow, while also reflectively looking at past disasters, the disaster kits and the store. This training is part of the original 4-step process in counter disaster management for the SLNSW, which began in 2000. Contractor training has been provided to external suppliers. Their sessions look at the bigger picture - risk assessment, preparedness, and the overall planning for disasters.

Cecilia Harvey and Tegan Anthes have completed preparation of 30 works which are to be loaned to the Museum of Sydney for the exhibition *Homes in the sky*, which traces the controversial place of apartment developments in Australia's identity and urban culture. **Lang Ngo** has been involved in the preparation of a forthcoming in-house exhibition of Max Dupain photographs. This exhibition celebrates the modernist idiom broadly, as well as Dupain's photographs of Australian modernist architecture in particular. Dupain's own words are used throughout the exhibition and, where possible, comments by architects provide alternative views of his photography.

Catherine Thomson has been working as the Digital Process Coordinator for the atmitchell.com project since late 2006. The atmitchell.com project is the Library's strategy to provide digital access to the collection via a sustainable and robust IT platform. Catherine's role has focussed on digitisation and workflows. She has been refining the policies, guidelines and workflow steps. The current phase of atmitchell.com involves Library staff trialling 12 test cases, User Acceptance Testing of the workflow software, TeamTrack*TM*, and the introduction of an interim Digital Asset Management system. Catherine and **Scott Wajon**, Imaging Services, recently visited colleagues at Museum Victoria, State Library of Victoria, National Gallery of Victoria and the National Archives in Melbourne, to see other institutions' approaches to digitisation and their workflows.

Assistant Conservators **Cathryn Bartley**, **Jessica O'Donnell**, **Aileen Dean-Raschilla** and **Silvana Volpato** have been assisting **Marika Kocsis** with the repair and flattening of 100 sub-division plans. These often large and colourful posters are subjects of the current digitisation program.

Trish Leen is working on a continuing pilot project digitising the *Sydney Gazette and New South Wales Advertiser*, the first Australian newspaper, in circulation from1803 to1842. The objective is to get the best newspaper copy then microfilm it to the highest standards ready for digitisation. The NLA, a joint partner, will carry out the digitisation. Even though it was under close official supervision and censorship at the time of publication, its listings of arriving ships and their cargoes, run-away

convicts, news from 'home' and the other colonies, makes it an invaluable historical record.

State Records NSW

Elizabeth Hadlow and **Dominique Moussou** helped with the de-installation of the *Bridging Sydney* exhibition at the Museum of Sydney in May. This lead to the return of about 70 items to State Records NSW that were on loan for the five month exhibition. Elizabeth has been on the road frequently in early 2007, advising agencies on a range of issues – the most pressing seems to be the storage and care of their photographic and film collections and other non standard records, such as plans and maps. Agencies are discovering some of their older non-standard records tucked away in storage around their facilities and they are realising that they need more care than is generally offered their paper collections. Dominique has been completing the repair of plans from the State Rail collection – these came to the attention of Conservation after a copy request by the agency during an exhibition development. As is usual with oversized records, the main problems are tears and sticky tape repairs.

Jill Gurney has been working on a number of large volumes that need to be taken down for digitisation. The decision to take the bindings apart was informed by improvements that can be achieved in the storage of the volumes in their unbound state. Many of them are photograph albums where the photographs are more important than the bindings, and we considered that improvements to the photographic storage, in addition to the need for digitisation, warranted taking the bindings apart.

SOUTH AUSTRALIA

Artlab Australia

The Paper Conservation Department, under **Fred Francisco**, is continuing work on a collection of ambrotypes and daguerreotypes belonging to Ayers House, a National Trust property in Adelaide. They are also busy removing Masonite backings from a series of charts owned by the Holden factory.

In the Book Conservation Department, **Colin Brown** has been conserving and making boxes for two volumes of Gould's *Mammals of Australia* and an atlas of *Flinders' Voyages of Australia, 1801-03*. **Liz Mayfield** has been carrying out a Preservation Survey for Campbelltown City Council Library, while **Michael Veitch** is conserving a book of George F. Angus prints.

The Painting Conservation Department have welcomed to their team **Christiane Varchmin**, an intern from Neuss, Germany. She has reinvigorated the team with her enthusiasm and we appreciate having her with us until September. She is currently working with **Eugene Taddeo** in examining and formulating treatment proposals for 21 Western Desert acrylic paintings for the South Australian Museum. The un-stretched canvas paintings have been poorly stored and some have water damage. Eugene and **Marek Pacyna** completed the cleaning project of 11 very dusty and grimy ship figure-heads on display in the South Australian Maritime Museum. Marek is undertaking the cleaning and structural stabilisation of a painting from the Art Gallery of South Australia's Collection, *Wilhelmina Watt* by Andrew MacCormack. He has also successfully completed a complex consolidation treatment of an ochre painting on Masonite that had extensive lifting. The painting is titled *Cave at Mt Leibig*, circa 1970's, and the artist is not known.

Chris Payne recently gave a workshop at Hahndorf Regional Gallery. He is preparing to undertake the removal of the Annand mural, a panel of tiles from the Nurses' Accommodation in Mildura. He is also involved in the treatment of the interior surfaces at the Martindale Hall in Clare, South Australia and is carrying out conservation reframing and maintenance of the Riddock Art Gallery's Collection. **Rita Bachmayer** has been preparing a number of painting loans for the George Lambert Retrospective Exhibition. She has recently participated in the Port Adelaide Historic Festival, promoting Artlab and the conservation profession. **Gillian Leahy** has completed treatment on a painting from the Art Gallery of South Australia's collection, Fred Williams' *Figure in a landscape*. She has also been involved with the George Lambert Retrospective loan and has prepared environmental reports for the Art Gallery of South Australia and the Migration Museum.

The Textile and Objects Departments are short staffed while **Kristin Phillips** and **Renita Ryan** have been in Yogyakarta, Indonesia presenting conservation workshops and demonstrating treatments with great skill, enthusiasm and humour. Meanwhile **Sophie Parker**, **Mary-Anne Gooden**, **Bee Flynn** and **Charlotte Jenkins** and have been preparing Asian objects and textiles for display at the Art Gallery. Sophie found notes from Thea van Oosten's plastics workshop a useful resource when working on a Japanese Inro 'coral' decoration, which proved to be very crumbly cellulose nitrate (Celluloid).

Artlab was delighted to welcome **Zandria Farrell** back to the team, after two years in Europe, to assist with a full program in the Projects Section. Projects have just completed a major conservation treatment on the South African War Memorial - **Joanna Barr**, Zandria Farrell, **Stephen Oates,** Mary-Anne Gooden, Bee Flynn**, Ian Page** and **Helen Weidenhofer** all contributed to the project. The project was especially complicated as the memorial is in the middle of a major intersection – so Joanna

invested considerable time navigating the complex public safety and traffic management issues. Helen is providing further support to Projects, which is greatly appreciated, and she is in the midst of managing the relocation of the Kingston statue, which is being moved to make way for the Adelaide tramline extension. Projects have now moved onto the treatment of the Kingston statue prior to reassembly in its new location and of the Venus Statue – the first piece of public artwork in Adelaide.

TASMANIA

Archives Office and State Library of Tasmania

The Zinc Works in Hobart celebrated their 90th Anniversary recently and **Stephanie McDonald** coordinated with them to prepare material and mount a small display in the Search Room. Among a number of other jobs, Stephanie has been working on the removal of Post-it-notes covered with self-adhesive tape. These were adhered to welfare adoption files by the government agency staff prior to copying for FOI requests. We are likely to see more of this type of problem, however we are working with government agencies to encourage better practices.

Penny Carey-Wells worked with Penny Smith (Curator and ceramic artist) to prepare an exhibition *Alice in the Allport* for the *10 Days on the Island* Festival. Seven ceramic artists made works in response to the Allport collection and on the theme of *Alice in Wonderland*. These works were installed in the furniture bay settings. The gallery held a *Mad Hatter's Tea Party* setting with ceramics decorated by a group of contemporary Hobart artists, with their *Alice* works on the walls. The chairs were decorated with wild, swaying book "hats", designed by Penny Carey-Wells and colleague Diane Pernt. While there was little conservation work involved in the preparation of the exhibition, there was considerable liaison concerning lighting and food arrangements for two real Mad Hatter's Tea Parties held in the gallery.

VICTORIA

The Centre for Cultural Materials Conservation, University of Melbourne

June marks the end of first semester for 2007, which will allow all staff who have been teaching regularly: **Robyn Sloggett**, **Marcelle Scott**, **Jude Fraser**, **Cushla Hill**, **Holly Jones-Amin**, **Nicole Tse**, **Caroline Kyi**, and **Petronella Nel**; or giving guest lectures: **Libby Melzer**, **Jocelyn Evans**, **Catherine Nunn**, **Thea Peacock**, **Briony Pemberton** and **Sean Loughrey** time to cool their heels briefly before stepping into the next round of courses in July which will quickly be followed by second semester.

We welcome **Kate Shepherdson** who is working full-time with Holly on several major projects. She presents a regular sense of calm in her application to reducing corrosion on metal objects and removing the marks of vandals from other objects.

In the paper lab, Briony has been a great addition, helping to keep abreast of the continual flow of work coming through the lab door. She is currently involved in a major project for the RAAF Museum. As well she is exploring rust treatments and is finding a solvent gel to be most effective in removing what is probably a 20th century adhesive from a work on paper. Libby has been involved in the mounting of an 18th century parchment, which will be housed in a free-standing perspex mount, a design originally developed by **Jordi Casasayas** for the display and housing of manuscript fragments belonging to the University collection.

Louise Bradley continues her work remounting works from the Baillieu Library's print collection. Some of the works she is remounting are over forty prints by Jan II Van de Velde.

Nicole Tse was awarded the Ian Potter Conference and Travel Grant which enabled her to present a paper titled *Southeast Asian Canvas Paintings: Supports and Preparatory Layers and their Mechanical Behaviour* at the ICOM-CC Working Group Paintings: Interim Meeting: *Preparation for painting: the artist's choice and its consequences* held at the British Museum.

Thea Peacock has been persistent in her efforts dealing with the extensive backlog of textile treatments that accrued during 2006. Some highlights among her projects are the preparation of items for three exhibitions for the National Sports Museum and for an exhibition of costumes and hats for the Australian Racing Museum.

In the painting lab, Catherine Nunn has been working on a variety of projects. She has been treating a painting on an aluminium support with corrosion problems and has recently begun a varnish removal on a Dutch 17th century landscape on panel. She is also doing research for a major treatment of an 18th century family portrait, examining avenues for treatment and investigating information about the presently unknown artist. She spoke recently to the AICCM Victorian Division at an *Off the Record* session about the treatment of a large painting from a country house collection, Simon de Vlieger's *Blockade of Amoy* (1650), she was involved in at the Hamilton Kerr Institute, University of Cambridge. **Caroline Fry** is part of the Asia Link Leaders 2007 program at the University of Melbourne, involved in exploring Australia's relationship with Asia. In

the lab she has recently performed a varnish removal on a George Lambert painting, *Farmer, Horse and Wife* from the Murdoch Collection (Newscorp). The removal of the yellowed varnish has produced dramatic results revealing the delicate colours that had been hidden under the caramel coloured surface coating. Jocelyn Evans is preparing to go to Harvard University to undertake a ten month advanced level training program at the Straus Centre for Conservation, the oldest fine arts conservation treatment, research and training facility in the United States. She recently presented an AICCM *Off the Record* talk on a project she managed; documenting and treating Groote Eylandt bark paintings from the Leonhard Adams Collection at the University of Melbourne. Marcelle Scott presented at the same session on her experiences in India at the joint AusHeritage/ INTACH (Indian National Trust for Art and Cultural Heritage) symposium.

The Middle Eastern Manuscripts Symposium Organising Committee: Robyn Sloggett, **Julia Greene**, **Tim Ould**, Libby Melzer and **Alexandra Ellem** have been pulling together a fabulous program on the care and conservation of Middle Eastern manuscripts. It will be held in November and immediately followed by two workshops: one a practical master class for conservators and bookbinders concerning the preventive and interventive conservation of Islamic Manuscripts, being run by David Jacobs, Senior Conservator at the British Library; and the other an Indo-Persian paintings workshop, a practical workshop focusing on the methods and materials utlilised in Indo-Persian paintings to be run by Anita Chowdry, a practicing artist and illustrator. Further details can be found at: www.culturalconservation.unimelb.edu.au/events/manuscript.html

Heritage Victoria

Susie Collis has joined the team at Heritage Victoria's Conservation Lab. She is working on archaeological material from multiple sites around the city of Melbourne as well as material from regional areas. Susie is enjoying working on the rich diversity of material housed at the lab and is consolidating and expanding her knowledge of conservation. The next challenge is to immerse herself in the various treatment options posed by the maritime archaeological lab, and she is being guided in these forays by **Barbara O'Brien.**

Barbara is currently working on refining the HV procedures manual and is midway through a challenging treatment on bitumen-coated, wooden water pipes dating back to the early 1900s. Barb is filling in for **David Graves** who has taken leave to work overseas in a very exciting project based at the new Islamic Museum in Sharjah (United Arab Emirates).

Jenny Dickens recently presented a paper on paint analysis at the Victorian Stucco seminar. She has been visiting a number of buildings to advise on conservation issues with materials such as paint, plaster, varnish and wood. Some of these projects are grant funded and others result from permits for works.

Museum Victoria

Michelle Berry, **Melissa Gunter** and the entire conservation staff have begun working on the mammal cool-room cleaning project, which will proceed throughout the month of May. The cleaning will conclude several years of work towards removing several hundred flat and stuffed skins that suffered a mould outbreak due to a mechanical fault. Melissa is cleaning and preparing various objects from the natural sciences and history and technology departments for the International Polar Year exhibition, which will be on display in the Discovery Centre in July this year. Michelle worked on the installation of the touring exhibition *Great Wall of China* and is currently developing a method for calculating light exposure in lux hours within the galleries at Melbourne Museum that are exposed to natural daylight.

Helen Privett and **Karina Palmer** continue to prepare objects for the long-term exhibition on the history and culture of Melbourne (opening March 2008). Karina is working on the extensive conservation and restoration of a Luna Park rollercoaster carriage for this project. **Alayne Alvis** coordinated the installation of the touring exhibition *Kebaya* (costume from Peranakan cultures in Malaysia) at Immigration Museum with the help of Karina and Melissa.

Angeletta Leggio has recently moved on to greener pastures within the Museum as Project Manager of the Digital Asset Management System Implementation. We are sad to see her go and thank her for the work and advice she provided in the treatment and exhibition of paper and photographic items. Before leaving, Angeletta organised the joint meeting between ICOM-CC Photographic Materials Working Group and AIC/PMG and presented a paper there.

National Gallery of Victoria

This period has seen the culmination of nearly two years of work for **Michael Varcoe-Cocks**, assisted by **Melanie Carlisle** (nèe Vella) and **Raye Collins**, in the preparation of works for the NGV's major exhibition for the year, *Australian Impressionism*. A huge body of technical, material and historical research has been carried out which will eventually be published. Since the exhibition opened, Michael has turned his attention to Paul Signac's *Gasometers at Clichy* for varnish removal, and Melanie has commenced cleaning a portrait by Reynolds, *Miss Offy Palmer*. Raye has carried out treatment on some of our paintings by Emily Kngwarraye. Through research following his treatment of two paintings, **Carl Villis** has successfully

reattributed two paintings in the Gallery collection: one is a portrait now recognised as being by Louis Tocqué, the other is a view of the *Grand Canal looking north-east to the Rialto Bridge* by Bernardo Bellotto.

The frames and furniture conservation section was also occupied with final preparations for the *Australian Impressionism* exhibition. Manufacture of a reproduction frame for Streeton's *The purple noon's transparent might* was a team effort. The new frame was based on remnants of the original frame, which were reacquired from the Benedictine Community of New Norcia in 1999. One of the most challenging aspects was that the section of oak leaf torus ornament remaining on the original frame provided a suitable model for only half of each side. This is because the diagonal ribbon banding over the ornament goes in opposite directions either side of the centre cross banding. We had the time-consuming task of adapting half of the new plaster casts made for the new frame, achieved by abrading off the ribbons with a Dremel tool, inserting new oak leaves followed by new ribbon bands going in the opposite direction. The gilding was undertaken by private gilder **Louise Poon**, and **Holly McGowan-Jackson** completed the distressing and toning of the frame. **MaryJo Lelyveld** and **Suzi Shaw** completed the toning and distressing of reproduction frames for Tom Robert's *Moorish Doorway* and Frederick McCubbin's *Lost* respectively.

Kate Douglas has recently de-installed *Thomas Harrison: Milliner* to make way for the Katie Pye exhibition that opened in May. **Christina Ritschel** has condition reported and treated over 30 works acquired for the exhibition, and **Bronwyn Cosgrove** has been treating Katie Pye works in the collection while managing the requirements of the pre-exhibition photography program. In addition to this, she has been treating NGV collection items selected for *Superbodies,* an exhibition of international fashion from the 1980s due to open in August. Kate has completed the lining treatment of an 1860s mourning dress, and **Annette Soumilas** has been working in the lab part-time, constructing 15 historical underpinnings for exhibitions focussing on the colour black in Australian and International fashion from the 19th century to the present day. These exhibitions are due to open early next year.

The paper and photograph lab is very pleased to welcome **Louise Wilson** to the team. In her first month, Louise has already been courier for items for a show at Mornington, treated works for the Piranesi show now open at NGV International, begun work for a forthcoming exhibition of Indian miniatures, and condition checked two hundred Fred Williams works on paper. **Ruth Shervington** performed treatment on Japanese screens now on display in *Golden Screens,* and has been fully occupied with the day to day running of things in the lab. **Pip Morrison** completed treatment on a number of albumen prints for the photograph show, *Small Worlds,* and she has been mounting and framing large format photographs by Rosemary Laing and Julie Rrap for various tours.

WESTERN AUSTRALIA

Art Gallery of WA

The Art Gallery of Western Australia is investigating its suspect drinking water, which appears to have caused an acute staff shortage: **Stephanie Baily**, **Kate Woollet** and **Vanessa Wiggin** are all on maternity leave.

Daniel Hoggar (paper) is currently on a two-year contract, having come from London (UK) via the National Archives & Library, Wellington (NZ). At present, along with maintaining the preventive maintenance overview and monitoring of the integrated pest management program, he has been working on the Norman Lindsay complete published etching collection, as well as the new Frank Hinder acquisitions. These tasks have been accompanied by his continuing progress in surveying the A-grade works on paper and organic objects.

The Gallery's exhibition and loans schedule is keeping **Maria Kubik** (paintings) occupied; the Paddy Bedford exhibition has recently been installed, while a large selection of paintings is being prepared for travel to the British Modern exhibition. The 2008 State Collection show is allowing more extensive treatments on some key collection pieces, including *The Old Oak* by Alfred Munnings, and ongoing materials research in collaboration with Curtin University and UWA.

Natalie Hewlett (exhibitions and display) is training replacement staff to make her transition out of Australia slightly easier for the rest of us. She has plans to travel to the US and is making a timely escape before *Egyptian Antiquities* from the Louvre hits the state.

Trevor Gillies (frames) was kept on his toes during the framing (and soon the unframing) of the *Raised by Wolves* exhibition, and he is investigating a reproduction frame for the Munnings. Spanish conservation student, **Pilar Molinar**, has been on a short-term contract while on exchange at Curtin University. She has been involved with treating an insect outbreak on indigenous artifact feathers, the A-grade survey, collection maintenance, and fostering an exchange of ideas and alternative treatment approaches.

Thread-by-thread Tear Repair of Paintings Workshops

February 2007, The University of Melbourne

Maria Kubik, Art Gallery of WA, with input from Jocelyn Evans, CCMC

Early in the year we had the good fortune of attending the workshop *Thread-by-thread Tear Repair of Paintings*, held twice at The Centre for Cultural Materials Conservation at The University of Melbourne in February 2007. The workshops were given by Prof Winfried Heiber, lecturer (retired) in conservation at the Academy for Fine Arts, Dresden, and Ms Petra Demuth, a painting conservator who now lectures in Berlin and Cologne.

Each workshop encompassed a comprehensive three-day program, addressing both the theory and practice of tear mending and associated deformation treatment. Thread-by-thread repair is a very useful tool to the conservator, especially where tear repair, without removing the canvas from the stretcher, is preferable. Examples of such cases include when the canvas is glued to the stretcher, when a double sided or unprimed canvas is involved, or when it is desired to preserve the original mounting system.

On the first day, Prof Heiber presented a theoretical seminar on his work with tear repair, illustrated with examples from his extensive experience with such treatments. He explained the mechanics of tension across warp and weft threads, how these influence the shape of the tear, and the preferential tearing parallel to the weft. He explained that due to the tensions developed during weaving, warp and weft threads are different lengths. This means that when stress is applied to the fabric, the shorter warp threads have insufficient stretch to absorb extra pressure and break first.

Prof Heiber convinced us of the benefits of thread-by-thread mending ('Rissverklebung') with a series of slides that showed tears before and after treatment. The mends were as good as invisible from both the front and back. Even though some of these tears had been complex and sizeable, mending had been achieved without removal from the stretcher or resorting to lining. Thread-by-thread mending is unique in tear-repair treatments in that it reinstates the continuity of movements in the canvas, and allows warp and weft to remain separate. It simplifies textural filling, and is also important to prevent new cracks and deformations from starting.

Different adhesives were considered and compared, including epoxy, polyamide welding powder, Paraloid B-72 and water based consolidants such as PVA and sturgeon glue. After much testing, Prof Heiber has found that a 1:1 mixture of 10% wheat starch paste and 20% sturgeon glue has provided adequate strength in most situations, combined with the most desirable working properties. Epoxy was considered an alternative in the case of wax-impregnated canvases.

Days 2 and 3 saw a return to the chemistry biology lab (but only to use the installed stereo microscopes!) for the practical component. Awaiting us in the lab was an exciting take-home kit for each participant, consisting of dental tools, fine tweezers, micro scissors, entomological pin, hotplate and small jars, in addition to our workshop manual. A welding needle with 1 mm flat tip developed by RH Conservation Engineering was also made available during the course and could be purchased at the end of the week.

Using a stereomicroscope with digital projector output on loan from Leica, Prof. Heiber and Ms Demuth wowed us with their technical skills, demonstrating the tear mending procedure in detail while we attempted to re-enact this at our own workstations. The procedure of mending involved first selecting two dental probes with corkscrew-like ends to manipulate the tear. With the paint layer face down, all the thread ends were gently plied upwards to permit addressing each thread one at a time. The broken threads were almost always frayed, which allowed for better contact between the two loose ends. Each thread was preconditioned with water and/or the dilute sturgeon glue and drawn out with probes or tweezers to elongate them and allow better overlap. The adhesive was kept at working temperature on a small hot plate. To dispense the adhesive, a reversed entomological pin was used (ie. with the bulbous end used as tip). Ms Demuth stressed the importance of using the smallest amount of adhesive and only to infuse those threads being mended. If too much adhesive is applied, the threads become bulky and can adhere to adjacent fibres. Any mistakes could be easily reversed by re-wetting and excess glue could be removed. Adhesive was next applied to the joint, and tweezers and dental tools were used to manipulate the fibres together. The heated needle was also used to relax and lengthen the thread ends. After checking the fibres for proper alignment and cohesion, the heated welding needle was used to heat-set the two ends together. After the bottom row of threads was attached, the top row of threads could be joined. Prof Heiber showed that it is important to maintain the weave functionality by only adhering the single threads together, rather than welding overlapping warp and weft yarns to each other and locking threads in place.

We were introduced to the technique by first joining single linen threads, then by mending a tear (self-inflicted!) in a small piece of aged canvas. The more ambitious (but perhaps more short-sighted) participants created large L-shaped tears with fraying and hanging threads before being told that these must again be mended! The secret to successful adhesion involved mixing the individual fibres of the threads, achieving the correct proportion of isinglass/ starch, and maintaining a suitable temperature of the isinglass mixture. Mending was slow progress; under the microscope opposing threads had to be first located, and then rewoven in the correct order. Decisions were required on a thread-by-thread basis as to what was needed; whether they were butt joints that needed strengthening with epoxy, or whether new threads needed weaving in.

After two days' worth of mending, participants were proud to show off their needle skills, although progress at this stage was still slow. Frau Demuth assured us this would speed up with practice, making all participants hope to find more tears in their collections soon!
The benefit of bringing across conservators from Germany included being able to share and discuss fresh ideas and solutions to common problems. Some of the tips gained from the presenters included:

- Prof. Heiber's Trekker system, developed to evenly draw together edges of tears. It was also shown to be useful for stretching apart canvases when compressed by shrinking.
- The use of cyclododecane spray to stabilise paint. This is used as a short-term alternative to facing, and as it completely sublimates off the surface is useful where crumbling or flaking paint may otherwise be at risk.
- Modifying a Lascaux stretcher to avoid fold-over edge damage.
- Using salt solutions in a humidity chamber for treating deformations.
- Easily creating regularly spaced bridging threads coated with Beva.
- Storing Isinglass in glass jars rather than plastic to prevent absorption of plastics, which can affect viscosity and adhesion.

In summary, it was a full and enriching program, and the provision of the required tools means that participants can now get straight into this type of work and continue to apply what they have learned.

A big thank you to Caroline Fry, with assistance from Marcelle Scott, Ally Long and Tina Kalliakmanis, for organising such a comprehensive workshop; the presenters were excellent and it is hoped more such mid-career training opportunities will be provided at CMCC in the future. The workshop was supported by a grant from Gordon Darling Foundation.

Development of the RH Micro Spatula

Robin Hodgson of RH Conservation Engineering custom built a micro spatula for use in the Thread-by-Thread Tear Repair workshop conducted by CCMC at The University of Melbourne. The prototype RH micro spatula was tested and used by participants throughout the Thread-by-Thread workshop.

The RH micro spatula was a key piece of equipment needed for bonding canvas threads, using the sturgeon/ starch paste adhesive mixture. The spatula operates from a plug pack to a fixed temperature of 45 - 50º C. At the tip a "Needle" of 1.6 mm diameter silver rod was machined to form a diagonal tip similar to a micro soldering iron. The standard 'over the counter' micro soldering iron operates to melt metal solder at 300 -350º C and is far too hot for animal glue, and was not suitable.

Robin Hodgson started his designs from scratch; utilized the expertise and machinery he developed in the manufacture of the other spatulas for RH Conservation Engineering. He developed a heating element that gave a reliable heat source at low temperatures, which was powered by a standard plug pack.

The RH Micro Spatula is in the form of a 'pen', which is lightweight and easy to manipulate. The plug pack connects by a standard cable to the top end of the "pen". The body of the pen is press formed to include a finger grip from 12 mm diameter stainless steel tube and has a matching cap to protect the spatula tip. Stainless steel was chosen due to its low thermal conductivity, strength and smart appearance.

The tip of the RH Micro Spatula has a nickel/ Teflon coating plating. This coating provides a wear and corrosion resistant finish with a low co-efficient of friction, and due to its' "non stick" nature, has the effect of keeping itself clean from the consolidant being used.

Robin Hodgson attended the Thread-by-Thread workshop and was able to better appreciate the requirements of the micro spatulas. In particular, he modified the shape and size of the tip to suit the requirements for bonding canvas threads.

The RH Micro Spatula will become part of the RH Conservation Engineering range. Robin will also manufacture a similar micro spatula, which will connect to the soon to be released Series 2 Heated Spatula Controller units. This gives a RH Micro spatula with an adjustable temperature up to 135º C, which is required when using the polyamide welding powder.

RH Conservation Engineering can be found at:
www.RHConservationEng.com.

Detecting Arsenic in Surface Residues on *Keris* Daggers

Georgia Harvey

Research undertaken as part of MA Cultural Materials Conservation minor thesis (University of Melbourne, 2006). Digital copies of the thesis are available upon request from the Centre for Cultural Materials Conservation.

Abstract
Testing was undertaken on residues taken from nine keris blades in Museum Victoria collections for the presence of arsenic residues. Two had significantly strong positive results, suggesting museum staff should be made aware of potential hazards when handling or treating keris. However, due to the variables encountered in this testing regime, the results can only be used to indicate the presence of arsenic rather than provide quantifiable data.

Introduction
The keris is a dagger indigenous to the Indonesian-Malay archipelago. The blade is often laminar in structure, comprising numerous layers of pattern-welded metal, including iron of various qualities, nickel, and nickel-rich iron (Zerner 1981; Solyom & Solyom 1978). This structure both increases strength and creates a multitude of surface patterns, known as pamor. Traditionally keris are stained with an arsenic and acid solution, which preferentially darkens the iron over any nickelous material, increasing the contrast of the pamor (Brus 1984: 72; Frankel 1963: 15; Raffles 1817 vol. 1: 352). Although the solution is rinsed away after staining, the question of whether free arsenic compounds remain on the blade has not been adequately addressed in the literature.

Keris feature in museum collections around the world. Museum Victoria has a sizeable collection acquired from numerous regions in the archipelago, the earliest one entering the collection in 1884. It was decided that residues taken from the surface of nine keris in the Museum Victoria collection would be tested for the presence of residual arsenicals. These particular specimens were chosen for a variety of reasons; generally the blades either had residues visible on the surface (Figure 1) or had particularly dark patinas, indicating past staining. Testing was carried out in the Museum Victoria Conservation Department laboratory in September 2006.

Method
The test used was a standard microchemical test kit (Merckoquant® Arsenic Test). The test requires an aqueous sample which is combined with two reagents, zinc and hydrochloric acid. A test strip, containing mercury (II) bromide in the reaction zone, is suspended over the solution; if arsenic is present in the sample, the vapours emitted from the reaction will change the colour of the test strip as mixed arsenic halogenides are formed. Because of the toxic arsine gas generated as a product of the reaction, all testing was carried out under a fume hood, and staff in the vicinity were notified of the testing.

Solid samples were picked or swabbed from the surface of the blade and immersed in 5 ml deionised water at least 30 minutes prior to testing and agitated occasionally, to allow any arsenicals present to dissolve. The tests were run as per the method outlined in the kit, after which the test strips were compared with the colour scale in the kit. Prior to testing the sample solutions, a control was run using a known sample of elemental arsenic (sourced from the Museum's mineralogy collection) dissolved in water. This both confirmed that the test was functioning properly and provided a benchmark against which the other samples could be compared.

Results
Of the nine specimens tested, two returned negative results (0.0mg/L), five had weakly positive results (less than 0.1mg/L), and two had noticeably positive results (between 0.1 – 0.5 mg/L).

Discussion
Results obtained from arsenic spot test kits are recommended as qualitative only (Sirois & Sansoucy 2001: 61). This may be considered particularly relevant when the use varies from the test's intended application: in this case, the main application is testing arsenic levels in ground water, although it is also used for solid samples dissolved in water. Sirois & Sansoucy report that when compared with results obtained using inductively coupled plasma-atomic emission spectrometry (ICP-AES), spot test kits detect significantly less arsenic in samples taken from natural history specimens (2001: 61). Several other factors contributed to the decision to use the results obtained to indicate the presence of arsenic only, without attempting accurate quantification. See Table 1 for these variables.

Table 1. Factors leading to qualitative reading of results only

Sample variation	The residues found on the nine *keris* varied widely, from powdery and crystalline to oily materials, or combinations of both. Some surfaces did not display any residue at all and so instead could only be swabbed with a damp cotton swab. This means the solubility parameters were different for all samples, and the sample size varied between each test.
Solubility	In an attempt to overcome solubility differences of the samples, the oilier samples were collected and/or solubilised in ethanol:water or acetone:water systems. While the tests were not run until the smell of the solvent was undetectable, it is possible that it had not entirely volatilised. No information could be found about either of these solvents causing interference with the test reaction, however this possibility should be taken into account.
Colour scale	The colour scale provided with the test kit was measured logarithmically (i.e. 0, 0.1, 0.5, 1.0 etc), so if the colour on the test strip did not correspond exactly to a colour on the chart, it was difficult to calculate the exact quantity of arsenic detected.

Of all the objects tested, only two returned results of 0.1 mg/L or higher, however, based on Sirois & Sansoucy's findings, all those samples which returned positive results may in fact have higher levels of arsenic than actually detected (2001: 61). Given the variation between the sample types, it may be suggested that were more uniformly-sized samples able to be taken, there may be a greater degree of uniformity in the results. It is noted that the keris, which were swabbed (in the absence of ample solid residues) correspond with negative or very slight positive results. However it is also noted that the reverse is not true, i.e. the largest samples collected did not necessarily yield stronger positives.

The extent to which a keris might be expected to carry arsenic residues may be related to the object's condition. When a keris is stained, the arsenic combines chemically with the iron in the blade to form a thin layer (potentially comprising compounds such as arsenopyrite, iron oxides and iron arsenates, see Harvey 2006: 36-38). As the iron corrodes over time, these compounds may decompose, releasing free arsenicals as corrosion products (Alan Maisey [keris smith] pers. comm. 29 September 2006). However, the sample with the second strongest positive result (0.1 mg/L) came from a keris which was in notably better condition than many of the other blades selected, so this hypothesis cannot be entirely supported based on these tests.

It is also possible that arsenic has been applied to keris post-acquisition into museum collections. Arsenic was a commonly used pesticide until the mid 20th century, and was regularly used to protect natural history collections from insect attack (Hawks & Williams 1986: 2). Being composites which often comprise organic parts (including wooden sheaths and handles), there is some chance that arsenic residues on keris blades may stem from this practice. However, with the traditional staining of keris with arsenic well documented, it seems reasonable that this is a more probable cause.

To get a sense of how much arsenic might be present on a blade, a hypothetical example is given:

Total surface area blade = 5000 mm^2
Residue taken from surface area = 1 mm^2
Test result (per 5 ml solution) = 0.2 mg/L
1 L / 5 ml = 200
0.2 mg/L / 200 = 0.001 mg/mm^2
0.001 mg x 5000 mm^2 = 5.0 mg arsenic present on blade (assuming residue is spread relatively evenly across blade).

While such an amount would not be fatally toxic, health risks caused by short or long term exposure to such objects is nevertheless possible (see Toxicity below). It is noted that it is standard museum practice to wear gloves when handling metallic objects such as keris, to prevent damage to the surface by salts and acids in the skin. However the friable nature of some of the residues means that if knocked and dislodged, arsenicals could come into contact with unprotected areas of skin, or be inhaled. Conservators brush-cleaning keris with powdery surface residues would be most at risk, particularly if using insufficient PPE. Unless warned of the potential hazard, conservators may not take due precautions: residues may just be interpreted as relatively harmless dust.

Toxicity

Arsenic is a toxic substance with extensive health implications caused by ingestion, inhalation and absorbance through the skin. Short-term exposure can cause nausea, diarrhoea and skin problems; longer term exposure can cause problems with skin, gastrointestinal tract, nervous system, mucous membranes, lungs, and liver, and has been linked to various cancers (Hawks & Williams 1986: 2; Budavari 2001: 136; ATSDR 2005: 7-8; WHO 1992). However, the toxicity of arsenic compounds to humans is dependant on a variety of factors such as the form it takes (i.e. organic/inorganic), its valency (trivalent or pentavalent), solubility, and the rate and concentration of exposure (ATSDR 2005: 30-31). Guidelines for safe levels of exposure are therefore context-dependent; no such guidelines have been found

which can be usefully applied to a general museum context. For example, the US Agency for Toxic Substances and Disease has compiled a toxicological profile for arsenic which presents minimum risk levels (MRL) for orally ingested inorganic arsenic (0.005 mg/kg/day for two weeks), however no levels have been set for arsenicals inhaled or absorbed through the skin (ATSDR 2005: 24-27).1

Conclusions

The results of these tests indicate the presence of arsenic on some keris blades. While it was difficult to accurately determine quantities using this type of spot test, the results suggest the arsenic residues may be of sufficient concentrations to pose potential health hazards in the workplace, particularly if staff are not aware of the risks. To gain more precise quantitative data, other forms of analysis (or more accurate sampling when using this spot test, including weighing of samples) would be required.

It would be a valuable step for institutions housing keris collections to flag these items as potentially hazardous. For example, the KE EMu database used by many large collecting organisations in Australia now includes a "Hazards" field (in the Materials tab of the catalogue module) which could usefully be populated with a warning. While the risks of exposure are minimal, the risk could be removed altogether by alerting staff to the possible presence of arsenic residues on keris blades.

Recommendations

Unless testing demonstrates otherwise, keris in public collections should be presumed to carry arsenic residues. Staff handling or treating keris should therefore follow some simple safety measures.

As mentioned above, keris should be labelled and/or flagged in the catalogue as potentially hazardous; samples retained for testing should likewise be clearly labelled and stored in a safe container/location

- All treatments should be performed in a fumehood

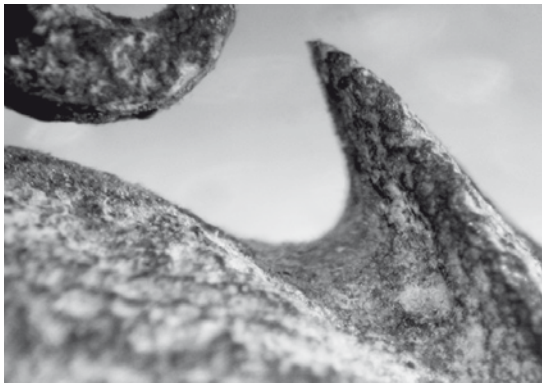

Figure 1. Surface residues visible in the worked features at the base of one of the selected blades.

- Gloves should be worn at all times and, together with other waste materials, disposed of according to set safety standards for hazardous materials
- Brush vacuuming should be performed using a HEPA filter, with the filter labelled or disposed of appropriately
- Tools and containers should be cleaned thoroughly and/or disposed of appropriately
- Other staff working in the vicinity should be alerted to the presence of potentially hazardous materials in the area.

Acknowledgements

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Endnotes

1 The World Health Organisation's Inorganic Arsenic Compounds other than Arsine Health and Safety Guide states: "In man, the smallest recorded fatal dose [oral] is in the range of 70-180 mg, but recovery has been reported after much larger doses … As to the chronic toxic effects caused by oral intake, it appears that the ingestion of 3 mg of inorganic arsenic per day, over a period of a few weeks, may give rise to severe poisoning in infants, and symptoms of toxicity in adults." (WHO 1992, accessed 29 September 2006). However, as these scenarios are highly improbable for conservators working with collections, such standards are not of immediate importance here. With regard to toxicity of inhaled arsenicals, the US Environmental Protection Agency has a permissible exposure limit (PEL) for arsenic in the workplace of 10µg/m3 for an 8 hour day, 40 hour workweek (EPA Standard No. 1910.1018 App A). This standard cannot however be usefully translated to conditions faced by museum workers.

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Education SIG

There are lots of new technologies that are changing the delivery of education programmes including RSS (syndicated news feeds) social net working blogs, wikis, and podcasts. To learn more about these new technologies, Education.au is offering training workshops in all capital cities between May and July. Interested? If so, registration is on-line at www.edna.edu.au/workshops. The education special interest group is developing a discussion link with EDNA to promote communication between educators who are not already members of AICCM. Please check the AICCM Education Forum for further discussion on these or any other education issues.

Julie O'Connor

POSITION VACANT

PAPER / PREVENTIVE CONSERVATOR AT PRESERVATION AUSTRALIA

Preservation Australia is seeking an experienced paper and preventive conservator. Based in Sydney, Preservation Australia is a private conservation business offering services in paper conservation, preventive conservation, workshops and seminars, and with a conservation and archival product line.

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Please contact Kay Soderlund on 02 9557 2395 to discuss the position, before July 20th 2007.

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Contributions are welcomed and should be sent to:
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