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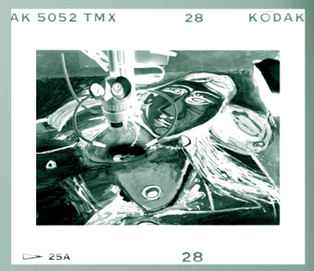

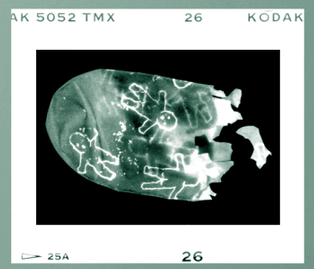

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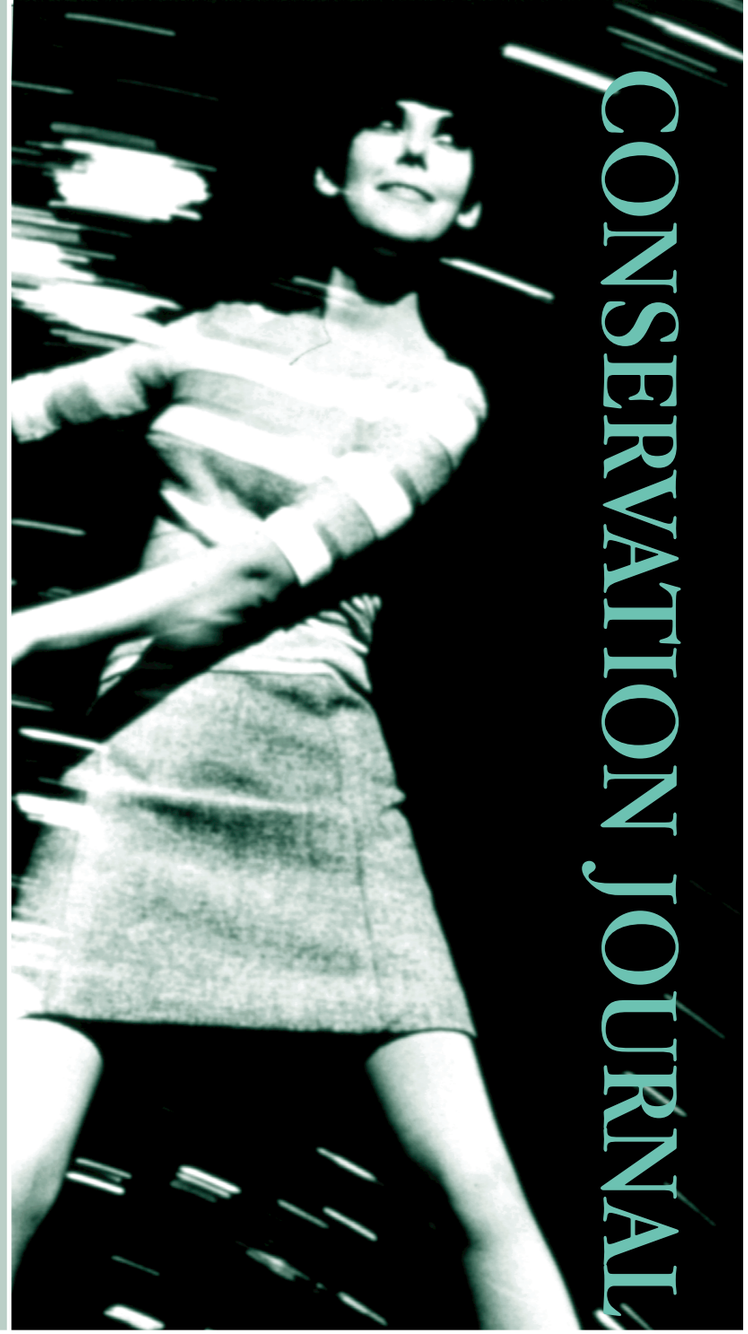

CONSERVATION JOURNAL

SPRING 2000

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The cover shows:
Peggy Moffitt, photography by Ron Traeger, *Queen*, 28th September 1966
Zanussi 'Oz' Fridge (Electrolux-Zanussi), V&A Photo Studio
Dyson DC05 vacuum cleaner, V&A Photo Studio
SMILE magazine detail, Monty Cantson, Photography by J. Rutherston
The Millennium Dome, Greenwich, Photography by NMEC
Detail of Picasso's Nude Woman with Necklace, 1968, Tate Gallery,
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Pablo Picasso, Seated woman in Chemise, 1932
Tate Gallery,
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EDITORIAL – A NEW LOOK FOR THE CONSERVATION JOURNAL

Victoria Button
Production & Managing Editor

The phrase "evolution rather than revolution" has been heard frequently within the V&A over the last months with regards to changes in the structure of the Museum management and staff alignment. Such terminology implies a slow transition, a less than radical change in procedures. What it actually means is potentially radical change but over a longer period of time. 'Evolution' seems a more apt term applied to the likes of the changes in the Journal, from its beginnings in the 1970s as the Conservation Newsletter to the Bulletin some years later and finally the Journal as we have known it since 1991. This editorial will describe the changes for this and future issues, not exactly revolutionary, but a change from what has gone before.

In Jonathan Ashley-Smith's first editorial in October 1991, he outlined the origins of the Journal from its beginnings as an in-house Conservation Newsletter and subsequent Bulletin to what it is now – a departmental journal that continues to meet its main aims: communicating to an internal and external audience what is going on within the V&A Conservation sections and their collaboration with Collections within the Museum. The growing national and international distribution broadens the circle by informing other members of the profession of our activities. The purpose of the Journal has not changed – the layout remains basically the same, but there are some stylistic changes.

It was timely to introduce the changes with this, our Spring issue, since 2000 not only marks the beginning of a new year, but a new century. We have agreed a 'seasonal' approach in that we will be producing three issues: Spring, Summer and Autumn. These proposed three issues will fit neatly within both the Department's and the RCA/VA Conservation calendar, in terms of work demands on the staff who produce and contribute to the Journal and the students' time-table. Three per year takes some strain off authors meeting deadlines and gives the editorial board more time for commissioning and chasing articles and for all the hard work they put in amongst their other commitments. It is also seen as an acknowledgement of the increasing pressure on every department's budget and our attempt to be seen to be taking notice by cutting production costs as our readership increases.

Such monetary issues brings me on to the other change that readers would have immediately noticed: the arrival of a nominal price tag on the front cover. Whilst we are still mailing the Journal to those who wish to receive it, for free, it is a reiteration from previous editorials that it may not be free forever; that we may not be able to sustain the Journal through dwindling budgets and progressing digital formats. It is also because we are hoping to be able to sell it through selected outlets sometime in the future. These two factors – reduction in issues per year and the threat of a charge – may be seen by some as backward steps but we have been at pains to point out that it is not. We are hoping to incorporate some longer articles by occasionally increasing the total page numbers in particular issues. Our aim is to produce to higher standards: less can indeed be more. An example of this is that the Department is at present in negotiations regarding launching the Journal on the internet which will give greater access, and flexibility in terms of access, to the information so far within the thirty four editions of the Journal. The most obvious change has been to the cover itself which has long been a monochrome format, albeit

with a different colour each issue. We have taken this opportunity in this themed Journal on the 'contemporary' to update the design. Elements from the contents rather than a list of contents themselves, now adorn the front cover as well as the contents page and staff chart. The changes to the interior, although more subtle, also speak for themselves. This will be the last appearance of the Science Surgery for a while owing to commitments to major projects. The main body of text and lay-out remains basically the same with the odd tweak here and there to graphics.

I cannot write about the changes without writing about the people who have been and continue to be involved with the Journal's production. The Journal is proof of the talent within the department. The redesign, instigated by the Editorial Board, was carried through by Danny Norman of Conservation Mounting with the collaboration of Keith Hartnell of the V&A Print Unit. Keith Hartnell is responsible for typesetting, layout and liaison with the external printers, which often means adapting formats as we go along to fit everything in. Many members of staff have been involved with the Journal over the years whether on the editorial board or through contributions. Without contributions from staff and students we would not have a Journal. Very few of us are natural born writers, but we all have something to write about at some stage of our professional careers and the Journal has proved to be a good vehicle for publishing first-time authors. It has been increasingly important that the Journal contain contributions from other V&A departments to reflect the links made with Collections and stress the importance of good communication as well as understanding the roles of other colleagues.

Reading through the past thirty three editorials, in the main written by our Head of Conservation, with the odd guest appearance in times of absence, it became apparent that the Journal editorials represent an interesting overview on the state not only of the Conservation Department but the Museum in general, often reflecting through internal policies the workings of external forces such as those set up by governments. The editorials also form a catalogue of the Conservation Department's history both within the Museum and as part of a wider profession. The Journal has proved to be a suitable recorder for the changes in conservation within an institution, but making the connection with the outside world by discussing many relevant themes from the world of conservation. Change can be threatening and intimidating but it can also be inspiring and beneficial.

CONTEMPORARY V&A

Susan Lambert
Chief Curator, Contemporary V&A

The V&A was founded as a contemporary museum. Purpose-built on a green-field site, its first deliberate collections were selected from brand new products sent from all over the world to the Great Exhibition of 1851. The Museum was, therefore, certainly a showcase for new products. However, what made it a contemporary museum had as much to do with promoting the economic growth of the country as with its role as a repository for new products of comparative design. Design improvement was recognised as a cyclical process crucial to a healthy economy in which every participant had a significant role: designers, manufacturers, retailers and perhaps especially, consumers. There was no point in designing and making good design if it was not sold and bought. The role of the Museum was thus to engage and inform people throughout the chain in order to improve the international competitiveness of basic British industries, such as textiles, ceramics, metal and wood-working, thereby maximising the economic impact of what we now call the creative industries. This remains a significant purpose of the V&A today and one as relevant now as when the Museum was founded. A wish to strengthen rapport with this audience underpins the current contemporary initiative (Figure 1).

Figure 1. Establishing rapport with our core audience. The V&A stand at 100% Design, Earls Court, designed by muf

The focus of the creative industries has, however, changed. The fundamental technical capabilities of industry have affected the process of design and the nature of the designed product. Engaging with contemporary culture in the same spirit as at the outset of the Museum means engaging with new types of products and practice. The V&A exhibition *Designing in the Digital Age* [1], for example, investigated how digital technology has transformed the process of design in relation to three powered products of a kind that did not exist when the Museum was founded: the refrigerator, the vacuum cleaner and the mobile telephone. Another new exhibition, planned for Spring 2001, will explore digital media as a medium specifically for original artistic expression. It will consist of a series of interventions by artists who will explore their responses to objects in the permanent galleries through digital means. Another example of the V&A's engagement with new media is the postscript to the exhibition, *A Grand Design*[2], an installation built around the idea of an exploding showcase. It can be read both as a work of art in itself and as a provocative comment on the needs of our public for exceptionally direct contact with objects in the future. How curators and conservators, with professional and ethical imperatives towards preservation, will respond to the implications of this critique will be challenging and interesting.

As important, therefore, for the contemporary initiative as ***what*** we show is ***how*** we show it. We are investigating forms of display which allow design to be experienced as well as looked at. As accoutrements of camping are now high design objects in a way they have never been before, we are planning an outdoor programme for next summer which will have a tent design competition at its centre. The public will be invited to inhabit the tents and one proposal is that sleepovers will be arranged in the school holidays. The opportunity that new media offers for participation is also being explored. A website complementing *Ice Blue, Sea Green Chandelier* by the American glass artist Dale Chihuly, now installed in the Museum's entrance hall, will enable virtual visitors to construct their own virtual sculpture from a range of Chihuly shapes, working collaboratively with other visitors to the site [3].

We are also investigating the role in display of the senses other than sight. Peter Ting's recent installation, *Place Setting* [4], looked at first glance like a rather bizarre table set but, with the aid of projections, in fact told a story

V&A Photo Studio

Figure 2. The resolutely new and the inspirational old
Fashion in Motion featuring Alexander McQueen in the Sculpture galleries

about dining. What was especially striking about this installation was that it was sound – the clunk of the cutlery on the porcelain and the glug of the water as it went into the glass – that made you realise that the installation was more than it at first appeared. Touch, the most thwarted of the senses in the normal museum environment, is another sense that we will be pursuing with exhibits especially designed to enable you to feel as well as to see.

Movement can be key to the full appreciation of design. Fashion in particular lends itself to performance. *Fashion in Motion* [5] is now a regular V&A event in which models in top-designers' clothes walk through the galleries providing an opportunity to see high fashion as it is meant to be seen: out of the glass case, on people, in motion. The designers select the galleries to be used for the walks and the models pose beside selected objects providing new contexts and thus new meanings for both the inspirational old and the resolutely new (Figure 2).

This touches on another aim of the current initiative: to provide a bridge from the world as we know it to the world in which the majority of the Museum's objects were made. The intention is to build on the vividness and accessibility of contemporary culture to explore issues relating to art and design throughout history, bringing a contemporary perspective to bear on the past. We are, for example, planning an exhibition of the work of Ron Arad, Professor of Furniture and Industrial Design at the Royal College of Art. The work will not, however, be shown as we used to do these things in the traditional contemporary white box of the Boilerhouse exhibition space but as an intervention in our Medieval Treasury. The exhibition will provide the opportunity to compare methods of manufacture then and now. Following in the steps of Alberti, Arad argues that regardless of when things are made there are only four ways of making: wasting, forming, casting and an assemblage of all three. This is a similarly but even more austere account of human technology than that of the theoretician and architect, Gottried Semper, whose functional categories of weaver, potter, carpenter, mason and metalworker still influence the organisational structure of the V&A.

The purpose of the V&A is not simply to provide a record of industrial culture but to participate in that culture. The contemporary V&A aims to position the Museum as an essential forum for dialogue and debate at which a wide range of voices are heard. The series of lectures by the architects and designers who are creating the Millennium Dome has drawn to the Museum many first time visitors from our classic constituency of design professionals (Figure 3). A series of conversations between leading industrialists and significant designers will build on this success [6]. The V&A itself, as always, will be only one voice amongst many. The quality and extent of the discussion which surrounds what the Museum does, will be one of the most important indicators of its success.

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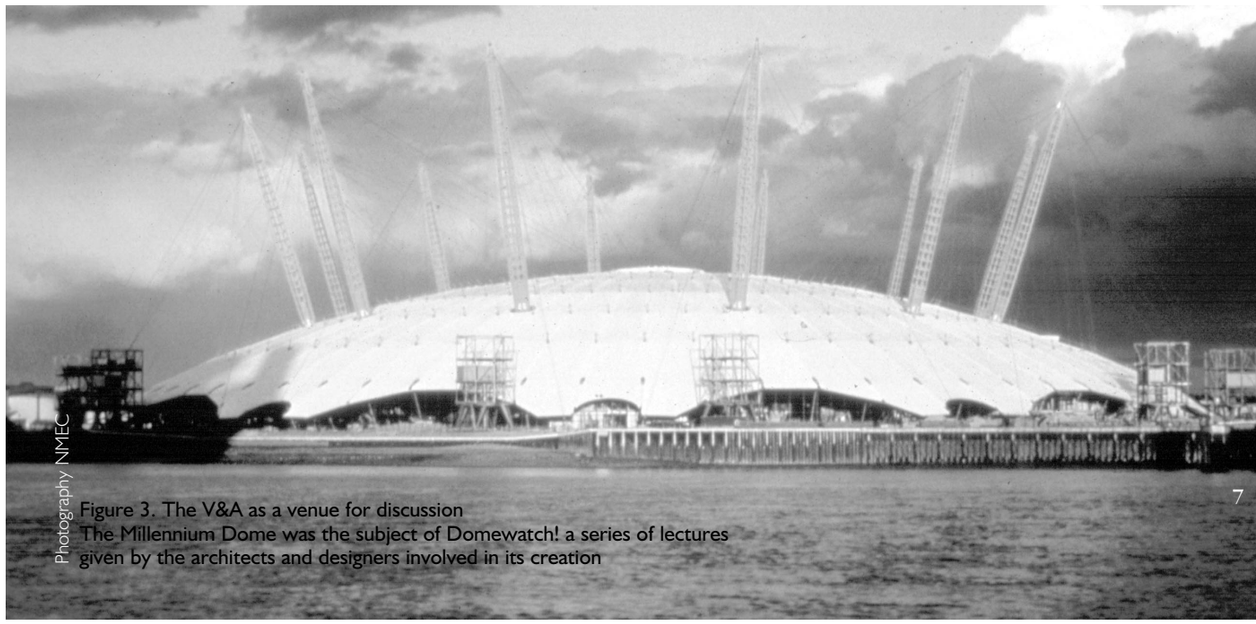
1. Designing in the Digital Age, Henry Cole Wing, 30 June 1999 to 3 January 2000.
2. A Grand Design, the art of the Victoria and Albert Museum, main exhibition space, 16 October 1999 to 16 January 2000.
3. To coincide with Chihuly 2000, an installation at the V&A planned for November 2000 to January 2001.
4. Place Setting, Spotlight installation, 2 to 16 November 1999.
5. Fashion in Motion, 19 January, 16 February, 15 March, 19 April 2000.
6. Dome Watch, Wednesday evenings, 27 October to 15 December 1999.



Photography NMEC

Figure 3. The V&A as a venue for discussion
The Millennium Dome was the subject of Domewatch! a series of lectures given by the architects and designers involved in its creation

TWENTY FIRST CENTURY CONSERVATION

Jonathan Ashley-Smith
Head of Conservation

At the time of writing it is the twentieth century, but by the time this piece is published it will be the twenty-first. This apparently rapid and dramatic change is an indication of how meaningless labels can be. It can be seen as an analogy for the process by which a short drive turns the latest auto model into a used car, and acquisition by a museum converts a contemporary artwork into an historic artefact.

The beginning of the twenty-first century is obviously "contemporary". The word "contemporary", which in its current usage at the V&A indicates "NOW", carries with it a little bit of the past but a much greater part of the future. At the very least, to be contemporary is to be uniquely and comfortably ahead of the uninformed majority.

With this in mind, contemporary conservation can be discussed under three headings:

- current and future conservation issues
- future problems with current artefacts
- future solutions to old problems with older artefacts.

Current and future conservation issues

There are two ways of deciding what future conservation issues might be. The first is *acrasia*, the phenomenon where people continue to act in a particular way even though they are fully aware that it is wrong or stupid. Publishers continuing to produce books, magazines and newspapers from materials that have predictably short lives, and for which there are known alternatives, would come into this category. So too would museums that continue to acquire vast archives without any hope of adequately storing or cataloguing them.

The second test is to look for future references to conservation problems. Science Fiction writers are usually intelligent people who have extrapolated carefully and consistently from specific sections of the current reality and their views, although fiction, are worthy of study. In the 1960s Harry Harrison[1]. predicted the neglect of the paper archive due to economic pressures and electronic alternatives. Twenty years ago Donald Moffit[2] suggested that even currently commonplace plastic objects such as bleach bottles would be collected for their rarity and treasured for obvious signs of their deterioration. E.M. Forster's classic *The Machine Stops*[3], written before the first world war, warns of the fate that awaits the human race if it develops an over-dependence on a single world-wide electronic means of communication, information and entertainment. On the positive side, in "Galactic Pot-healer", Philip K. Dick[4] expects there to be a long-term future need for ceramics conservators. And specialists in the fragility of civilisation Larry Niven and Jerry Pournelle[5] see highly secure museums as the only way that knowledge of past progress will be made available to peoples emerging from future dark ages.

A more pedestrian and shorter term way of predicting future world states is the STEEP[6] analysis. This looks at five groups of drivers for change; Social, Technological, Environmental, Economic and Political. Social, political and economic factors are sometimes difficult to disentangle. Longer human life expectancy and greater desire for lifelong learning may lead to optimism. But some interpretations of demands for social inclusion and access, when combined with decline in funding from national and local government, lead to more pessimistic predictions. Current ideas of future global climate change suggest an increasing mismatch between the specified environment in which museum buildings and stores were designed to function, and the environment in which they will find themselves.

The technological factors that most people cite are the dramatic spread of the internet and the potential for interactive education using digital "computers". People who say that virtual reality is a threat to the value of the physical reality are criticised as Luddite and ignorant of the evidence. However, the short-term evidence is that use of the internet is increasing exponentially and physical attendance at museums of historic artefacts is in decline.

Future problems with current artefacts

Both contemporary artefacts and contemporary ideas about display pose conservation problems. Modern materials are not necessarily designed for long life and, by definition, have not had a long period of testing in service. We know that polyurethane foams in furniture and toys disintegrate within decades. We know that textiles containing elastanes are sensitive to humidity and light and have life-spans even more limited than those made with impermanent natural fibres such as silk. As with the materials, the methods of construction of contemporary objects may well be experimental and fail in use or in time. Objects that have failed this way in the past are obviously not available. And contemporary objects fail in the museum before our eyes.

Within historic collections, the object and its unique physicality is all that is left. The function of the object in context is lost. What may actually be more important is its context within an historic event or some exploit of its owner or designer. With contemporary objects this is generally not the case. The context, connections and active use of the artefact are obvious and available. This means that the relative value of the object itself can be quite small and the need for preservation is not apparent. Or perhaps it is that the need to preserve all the other evidence of the context should be as important.

The electronic age also provides vehicles for information such as radios, televisions and personal CD players which are sometimes beautiful artefacts, although they may seem obviously empty as non-functioning museum objects. However, no matter how interesting the original vehicles, the information which they can present is considered more important. The media for storing this information (such as tapes and CDs) do not have guaranteed long working lifetimes, but the main problem is one of maintenance of compatible systems; a betamax tape requires a betamax player in order to display the information it contains. Constant reformatting of information from obsolete to current systems is expensive, and therefore selective. Meanwhile obsolescence reduces the value of the original vehicle to a point where it will seem too extravagant to spend money on repairing and re-using it (even if spare parts are still available).

These days much information is presented (it would be misleading to say 'maintained'), only in electronic form. There is no original or subsequent physical object that can be interrogated or enjoyed without using an electronic system. Internet sites are not automatically archived and changes may take place without there being any record of development. This can lead to subtly wrong interpretations of the recent past. This is a growing preservation problem that challenges current definitions of archivist and conservator.

Beyond the glass case

The exhibition *A Grand Design*[7] portrays the history of the V&A through its objects. The transition into the next century is dealt with in a section entitled "Beyond the Glass Case". Although there is very little public complaint about having to view historic objects through the walls of a display case, the glass box is seen as confining and inappropriate for contemporary material. Most members of the public will accept that there is a need for restricted light levels on historic material. Yet to many it seems ludicrously over-protective to suggest the same lighting regime for modern material. While everyone would accept that it was excessively damaging for models to wear original historic costume for display purposes, no-one would accept the views of a conservator who demanded that the latest fashion creation should not be displayed on a living moving human.

However the protection which is accepted for the historic object is equally needed for the modern if it is intended that the contemporary object is to last longer and better than the rather sad looking historic artefact has so far managed. Many of the common physical and chemical agents of change inflict most damage in the earliest periods of exposure. Preventive conservation is most effective when started early. Indeed it can hardly be called preventive if it is delayed until the object is obviously damaged.

It is not wrong to deliberately damage objects, we do it all the time through display or conservation treatment. It may be wrong, or at least stupid, to damage objects unnecessarily fast where there is no obvious immediate benefit and there is a known long-term cost. The more we study contemporary materials and constructions the more we will find ourselves applying the *acrasia* criterion for predicting future conservation problems.

Future solutions to old problems with older artefacts

Digital technology handles mathematics more happily than do the majority of museum staff. Mathematical modelling can be used to predict future states of collections. The systems deal with the concept of probability more readily than do human beings who are always looking for some pattern, some simple cause and effect relationship. Mathematical modelling could also lead to greater understanding of the value museum decision-makers place, not only on the present state of objects, but also on the future state. It is important to understand the differing ways that politicians and museum managers discount the future benefits to be derived from collections. Understanding is important if we are to keep a sense of proportion focussing on key problems. We need to avoid getting upset now about contemporary practices that will not lead to serious future conservation issues.

If the pace of change is getting faster, then the first two decades of the next century should bring many times more change than we have seen in the last two of the present century. This would not be asking much in terms of new materials for conservation treatment since nothing useful has appeared recently. If there has been a trend it has been mostly toward new attitudes, and very little toward new practical techniques. If recent trends are continued there will be increasingly less practical intervention. Computer visualisation techniques allow virtual restoration. This is not often used to plan actual improvements to the real object but more frequently seen as a substitute for the proposed intervention. Thus once again modern technology could be a threat not only to the value of the real artefact but to the future of a skilled artisan.

Some of the questions left unresolved in this discussion are the subject of research options proposed by RCA/V&A Conservation. See details in the website at www.conservation.rca.ac.uk

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MASTERS NOT SLAVES – NEW TECHNOLOGY IN THE SERVICE OF CONSERVATION

Tim Carpenter
Information Systems Manager, Conservation Management Services

Introduction

In the 1984 summer edition of what was then called the Conservation Newsletter, Dr Jonathan Ashley-Smith published an article entitled "Confessions"[1]. He stated that he might have been a bit hasty in embracing the dawn of personal computers and all that it offered the Conservation Department. He feared that there was a real danger of allowing this "small box with inanimate bits of wire"[2] to dictate the working practices of the Department, so that the slaves have become the masters. I believe that to a certain extent Dr Ashley-Smith's fears are as true today as they were sixteen years ago. In this article I will explore to what extent the Department exists in a digital cage of our own creation. But, I will also outline avenues where IT can be employed to enhance the work of the conservator and present these works to a wider audience.

The key to any effective systems implementation or enhancement is to ensure that it addresses a real need or development rather than employing technology for technology's sake. It is worth remembering that the construction of Stonehenge, St Paul's Cathedral and even The Crystal Palace was executed without the aid of networked PCs. However, I assume that the custodians were happy with the end result: the venues were generally self-publicising and public attendance was, and still is good (although the original purpose of these constructions may have changed). The "Digital Revolution" has changed the working practices of almost every office and organisation throughout the world, and typewriters are now more likely to be exhibited in the V&A than used in any of its offices. These advances in technology can potentially provide unlimited development opportunities within the Conservation Department.

What we're aiming for

A new phrase has emerged to encompass all of this exciting new technology: "Information Systems". The temptation is to embrace everything that information technology has to offer in the hope of creating a universal electronic fountain of all knowledge. So what makes the Department hesitant? The answer is quite clear. It is an increasing concern that the current information systems in the Department are dictating the working practices of the conservator, effectively taking conservators away from other important tasks within the Museum such as condition surveys; promoting the work of the department internally and externally; and of course practical conservation. The ultimate goal has to be an integrated system that services the information needs of the Department, the Museum and the profession as a whole; providing maximum efficiency with minimum maintenance.

Why isn't it working as well as it was intended?

Many of the conservators have commented that certain IT based practices within the Department were managed far more effectively with the use of simple forms and checklists; one example being the movement and tracking of objects within the Department. There are inherent advantages using paper-based systems. Paper can be written on, corrected and circulated with more ease than with a PC. Paper is more flexible and there is no need to print out a hard copy of something that is already…hard. Therefore, it is imperative that there is a demonstrable benefit to spending time on updating electronic object location systems (CONCISE, the British Galleries object database) and therefore away from practical conservation. To this end, consideration has to be given to the amount of time that conservators spend maintaining or retrieving information from systems. There should be an acceptance from the people that require electronic information from conservators that the time spent working at the computer is time taken away from other equally important activities. Thought should also be given to the long-term relevance of the information it produces. A database that records the movement of objects is more useful than a file full of paper to certain parties within the Museum, but only if the database is well designed and maintained. This is time consuming and requires quite a high level of IT knowledge. Is it the responsibility of the conservators to become database operators?

There also needs to be a distinction between management information and information systems. Management information is a monitoring tool, an upward flow of information that has a limited audience and life span. Information systems should be designed with a longer-term view. They need to provide relevant information at a variety of levels to satisfy the information needs of a multitude of audiences. In short, information systems should provide recyclable information. The loss of valuable time and resources occurs when an information system is designed purely as a tool for generating management information. Management information should be a by-product, rather than the end product of an effective information system.

Not the answer, but the way forward

It is sometimes useful to put aside the word "system" and replace it with the concept of "service". Existing systems should have their usefulness assessed in the workplace to ensure that they are effective tools within the Department rather than a system that produces a restricted end product. Information systems should carry out a function that could not be executed in any other way but via a computer.

Any new post within the Department has an agreed job description, recruitment, interview, contract, probationary period and regular reviews to assess progress to a given performance criterion. So should information systems. The key to a successful information system is employing the correct people with the correct skills to research, consult and service the needs, allowing the specialists to concentrate on the work at hand.

The happy ending

Successful partnerships can be established between the conservator and information technology. A good example of this is in the recent advances made in digital image applications. Images could be taken by a conservator of an object from its initial assessment during a condition survey, through the various stages of conservation, to either subsequent display or storage. Storage and manipulation of these images is simple and cost effective, and would serve both as a record, and as a useful resource for publication (in hard copy or on the web) to conservators and curators alike. Thus, use of digital imaging technology can provide a reusable resource, useful within the Department, within the Museum, and with potential to disseminate information world wide through the Internet.

Conservators and scientists within the Department are constantly adding to their existing fund of information and sharing their findings through published works and seminars both at national and international level. There are also a number of research projects within the department. By publishing these works and even the V&A Conservation Journal itself on the Internet, the potential audience is significantly increased. There are also opportunities to instigate more adventurous projects such as a virtual conservation studio, on-line consultation or digital video imaging.

People constantly see themselves moving forward, taking time only to glance back and gloat over the primitive technology and applications that were employed previously. However, as I have discussed, there must be a tangible, measurable benefit to any new system employed within the Department.

As the use of information technology becomes increasingly less specialised and therefore more widespread, the work of the conservator will continue to be a highly specialist activity. If we are to accept that information systems are an inevitable part of the conservator's life, we have to objectively monitor the relationship between the computer and the conservator to ensure that optimum time is given to this specialist work.

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DIFFICULTIES IN THE SCIENTIFIC STUDY OF SYNTHETIC MATERIALS IN PAINTS

Francesca Cappitelli
RCA/V&A Conservation (with the Tate Gallery), MPhil student, 20th Century Paint Materials

The scientific study of artists' materials in painting covers a wide range of subjects. Although paints contain many compounds (extenders, additives, etc.), those most investigated are pigments and binders. Indeed, a lot of literature is available regarding the chemistry of traditional binders used by artists, in particular oils. However, little has been documented about the various synthetic materials which have been introduced throughout the 20th Century[1].

The first synthetic paints were house paints and industrial coatings and it was in these forms that artists first used them. These synthetic materials display a lot of useful properties: quick drying time, transparency, high flexibility, good adhesion, resistance to chemicals, stability to thermal stress, light and UV radiation. House paints are cheap compared to artists' products, and can give particular visual effects. It is useful to keep in mind that companies formulate house paints for completely different purposes and they are likely to be more vulnerable to deterioration than artists' quality paints.

It is thought that in 1932 the artist David Alfaro Siqueiros [Mexico, 1896 – 1974] used for the first time a synthetic binder – ethyl silicate – for his paintings. Introducing modern materials, Siqueiros together with Morris Louis [USA, 1912 – 1962], Jackson Pollock [USA, 1912 – 1956] and other artists had to develop new methods of paint application, such as spray guns and airbrushes. The introduction of synthetic resins was one of the most important revolutions in the history of painting[2].

Nowadays, there are three classes of resins mainly utilised for paint. These are poly(vinylacetates) or PVAs, acrylic resins and alkyd resins. Alkyds have been the principal binder in oil-based housepaint since the 1950s. PVAs and acrylics, although initially resin-in-

Photograph by Fotini Kousiaki

Figure 1. Preparing samples for PyGCMS

solvent formulations, were sold as emulsions from the 1960s, which became much more commercially successful.

It might be thought that it is easier to study modern materials than old materials because one can still buy the products being studied and compare them with paints found on artworks. This is not entirely true. It is known that Picasso [Spain, 1881–1973] used a French product named Ripolin in some of his paintings. If one searches for this paint on the web, one finds that a Spanish company now produces Ripolin. Is this company the same? In all these years has the same paint composition been maintained? In investigating the composition of these resins, one has to cope with the problem that if the products are still on sale, companies are very reluctant to give information about them, and if the products are no longer available, companies do not always keep records.

One of the most obvious approaches to the study of modern materials is to interview those artists who used them. Unfortunately, not all of the artists are still alive and, even when they are, what they remember is not always what they actually did.

In order to study the chemistry of synthetic resins the most common technique is Fourier transform infrared spectroscopy (FTIR). FTIR is normally used as a comparative technique with the spectrum of each unknown material being matched either visually with a library of known standards or through a computer-generated search. Another useful technique is pyrolysis gas chromatography mass spectrometry (PyGCMS). Pyrolysis (breaking down the paint medium into smaller molecules by heat) is necessary because of the high molecular weight of the resins involved (Figure1).

Both FTIR and PyGCMS help to establish the type of synthetic resin being studied. Both techniques have been very useful in investigating acrylic paints; however they provide little information on alkyds and PVAs. In general, these two techniques provide no detailed information about the components of chemically complicated structures like alkyds. Consequently, some conservation scientists involved in modern materials have realised that it is imperative to find new techniques which can give more details about alkyds and PVAs. This is the gap that my research project on the RCA/V&A Conservation programme, supervised by the Tate Gallery conservation scientists, would like to fill.

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SIGGRAPH 99, OR WHY A CONSERVATOR SHOULD ATTEND A GRAPHICS CONFERENCE

Athanasios Velios
RCA/V&A Conservation, MPhil by Project

Introduction

Over the past few years, the annual SIGGRAPH conference has undoubtedly been the most important annual event in computer graphics. SIGGRAPH is the Special Interest Group on Computer Graphics of the Association for Computing Machinery. In August 1999 the Los Angeles Convention Centre was flooded with people from all around the world who had come to exchange ideas and be informed about the latest technologies and achievements[1].

Totally different professions and interests gathered together because of their relationship to computer graphics. Animators and graphic designers, doctors and engineers, artists and art historians, software developers and researchers, botanists and others joined in discussions and shared ideas about the different potential applications of the same technologies to their diverse fields.

Hundreds of presenters at the conference and the art show, and more than 40,000 visitors to the exhibition were expected this year. Among them were a few conservators, who could see the connection between their own profession and the digital technologies on show. Angela Geary and I attended as we are both working on the application of three-dimensional computer technology to conservation. For Angela's research with RCA/V&A Conservation, computer graphics is a perfect tool for introducing a new perspective in museum object presentation[2] and for mine, a potential tool for reconstructing ancient fragmented objects.

Conference

"Scanning of the Michelangelo's Florentine Pietá"[3] was the first conference paper directly relevant to digital conservation and the computer-related research being carried out on the RCA/V&A Conservation programme. The lecturers gave a very detailed description of the strategy they followed in order to digitally capture Michelangelo's sculpture. The presentation was divided into two parts: the acquisition part (when all practical work was done) and the processing part (when the collected data were manipulated). The practical problems encountered whilst working at the museum were discussed. Although the project was very carefully designed from the beginning, the modifications which had to be made during the work proved that there is no way of predicting every possible problem which may occur on the site. Nevertheless, the potential for solving such problems can be maximized with a flexible approach. Therefore lightweight, portable equipment was used which included a scanner (pattern projector with six cameras, c.2mm accuracy), computers and equipment for support (ladders, tripods etc.).

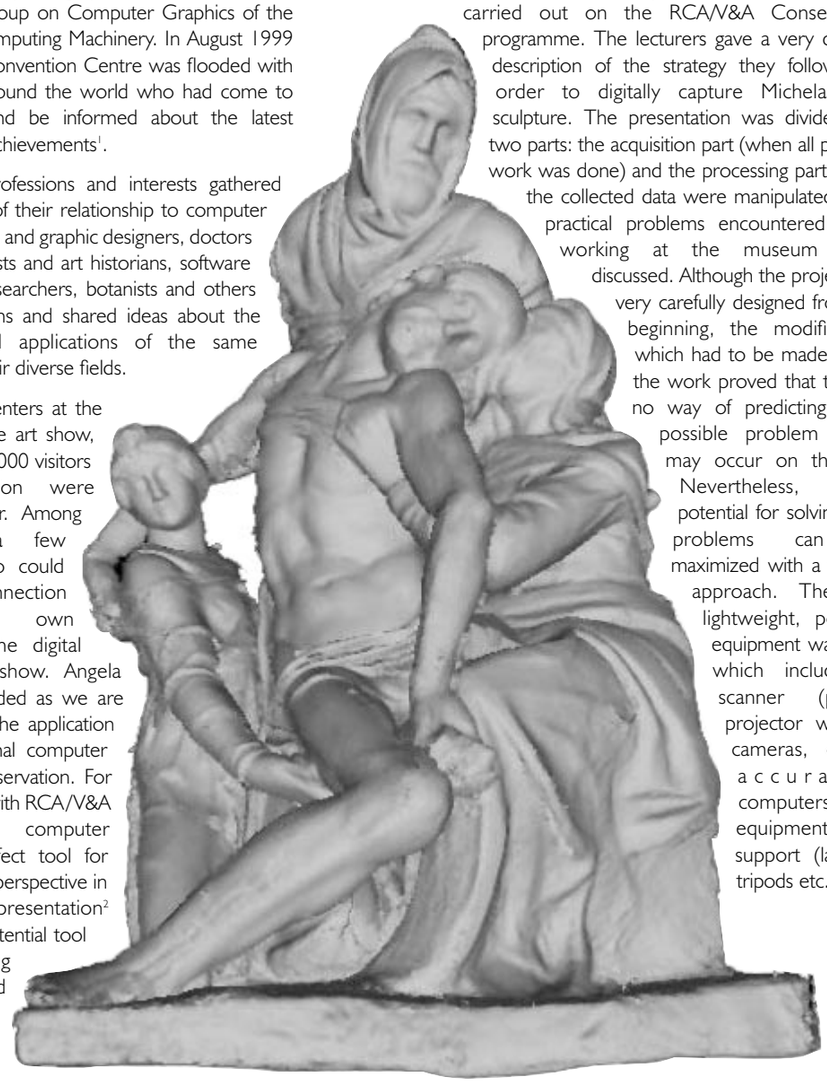

Figure 1: The digital model of the "Florentine Pietá" reproduced courtesy of Holly Rushmeier, IBM T.J Watson Research Center

The acquisition of the data was done in less than a month. The time-consuming part of the project, though, was the processing of the data. This took over three months, because all the datasets needed to be combined to form the final triangulated model (Figure 1). As the statue was 2m tall, there were 500 individual scans, which had to be positioned relative to each other. This was done by taking pictures as laser beams were projected on the object. Laser beams highlighted certain points which could be easily identified in all pictures. Special reference was made to the algorithms (series of computations in a computer programming language) for the construction of the model and those used to normalize the colour difference among the pictures used for the mapping of the model. Mapping refers to the process of placing a 2D image on a 3D model in order to represent the quality of the surface. Finally the model was placed into a virtual environment and it could be viewed in a wide range of different ways (light conditions, viewing positions etc.). Although, comparing to related work mentioned later in this article, the final result of the whole project was not totally satisfying, the description of the methodology and the considerations made before starting were very helpful since similar work is in progress in the V&A Conservation Department.

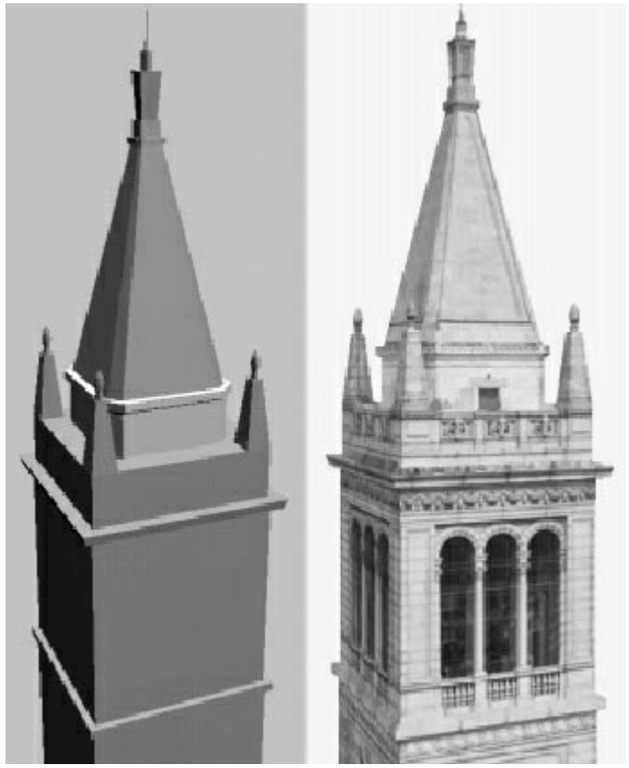

Figure 2: A simple model can look realistic with a well-prepared mapping, reproduced courtesy of Paul Debevec, University of California at Berkeley, http://www.cs.berkeley.edu/~debevec

A full day course on "3D photography"[4] was probably the most important part of the whole event for us. Five lecturers covered a wide range of themes from desktop scanning to façade modelling. Two lectures summarised the basic principles of photography, digital photography and stereo vision. Alongside these, Paul Debevec described how to use 2D images to construct basic 3D models of buildings. Bearing in mind the equipment he used (digital cameras only), the final product was more than adequate for presentational needs. He showed how correct placing of the mapping images can help simple models look realistic (Figure 2).

In the afternoon session, Jean-Yves Bouguet talked about using very basic tools to scan 3D objects. He described how a lamp, a camera and a pen can be set up in order to function as a 3D scanner. The object is placed under the lamp and a pen is moved so that it casts shadows on the object. The whole movement of the shadow is recorded with the camera and the object is reconstructed based on the deformation of the shadow on the object. One would expect poor quality results with such means but, according to comparisons between the actual object and the 3D reconstruction, the error was lower than 1%.

A totally antithetical approach was presented by Marc Levoy who used state-of-the-art technology for the scanning of Michelangelo's statues in Florence. Although little was said about the methodology, the equipment they used was carefully described. Three types of 3D scanner were used, one from Cyberware®, (with a total height of 7m!) (Figure 3), one from 3D Scanners® with a FARO® arm and a long-range scanner from Cyra®. Because of the high quality of the equipment as far as resolution is concerned, huge amounts of data were produced which at that time were still being processed. Undoubtedly, the Michelangelo project was the most impressive on laser scanning; however, one wonders whether the result would have been less satisfying if a lower resolution had been selected more carefully? Moreover, what about the cost of the equipment? Is it worth paying thousands of pounds to achieve such a high resolution if you do not need it, or can achieve a similar result in a less expensive way?

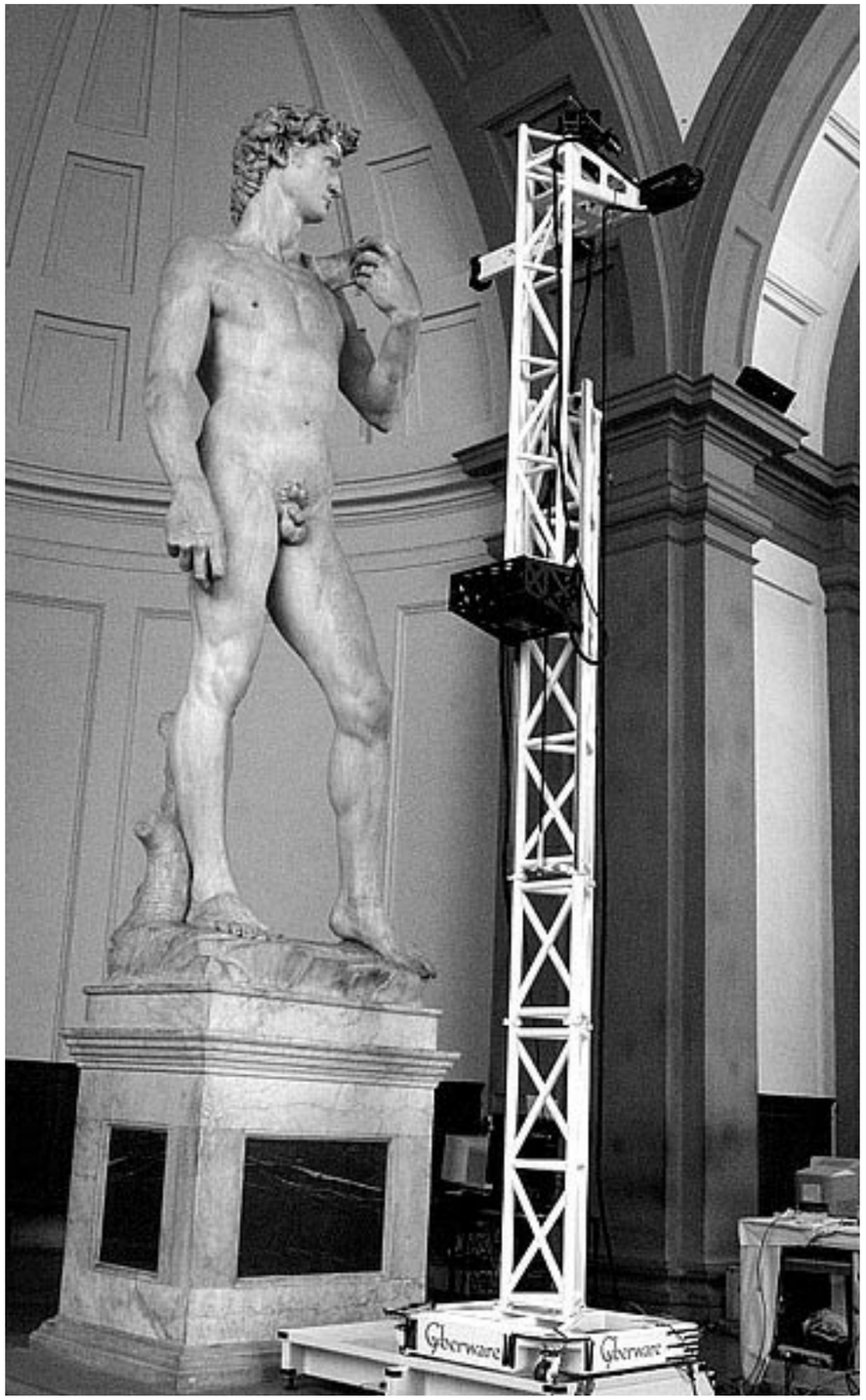

Figure 3: The scanner from Cyberware® scanning "David" reproduced courtesy of the Digital Michelangelo Project, Stanford University

"Animating fractures of brittle objects" was probably the most innovative and important paper in the whole conference. It was presented by James F. O'Brien and Jessica K. Hodgins[5]. An algorithm was created which allows models to "break" after collisions according to physical properties set by the user. This algorithm could be extremely useful to conservators since it is a convenient tool for studying fractured objects and the way fracture occurs in brittle materials.

Exhibition

The exhibition attracted, as always, a lot of visitors. All the major companies tried to impress visitors with multicoloured booths, extremely powerful hardware and entertaining shows. Several companies which produce laser scanners and photogrammetric systems were there, allowing us to talk with technicians and engineers about the principles of each machine, its accuracy and cost. Apart from the specialised 3D scanning equipment, we saw new hardware systems, powerful processors and graphics cards, real time video capture cards, storage media and plasma monitors.

Software demonstrations were also very interesting. Latest versions of popular software along with less user-friendly programmes were on show during the three days of the exhibition. We actually had the chance to work on some of the programmes, which is very helpful when you want to assess software.

Art show

Each year many young artists submit their work to SIGGRAPH's committee. Only a few of them manage to show their work in the exhibition. Due to the competition, the standard of work is always very high. Being a conservator I often find myself unable to enjoy a work of art completely, as the first thing I look for is the way the artefact is constructed and the possible deterioration or corrosion which may take place in the future. I could not avoid this happening at SIGGRAPH 99.

One of the installations, for example, consisted of small flash lamps, speakerphones and motion detectors, the viewer's movement was detected, triggering a sound or flash[6]. What will happen if in 20 years' time a speakerphone breaks down? Should it be replaced by a new one? Probably not. Different speakers have different sound qualities and it would not be ethical if the sound quality was changed. Therefore, the speakerphone is repaired. How does one repair a 20-year-old speakerphone? Does one use new material, new wires and new electric components or try to conserve the original ones?

This, however, is a relatively easy case compared with another installation which was presented. A small iron sphere was magnetically guided on a layer of sand, forming several patterns. The sphere's route was pre-calculated by a computer[7]. How does one preserve the final product? How can a conservator preserve the formations of plain sand? Moreover, if we agree that the process of the creation of this shape is the actual artefact and not the finished product, how can one preserve the software, which produced this shape? I will not talk about conservation of digital storage media as this is a huge subject, but I will mention crashing operating systems and software, which is very common. Maybe a future subject area in conservators' education will be computer programming and program debugging.

Acknowledgements:

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Note: SIGGRAPH 99 proceedings (refs. 3 – 7) are published as a CD-ROM

"MY PICTURE IS A SUM OF DESTRUCTIONS", PABLO PICASSO (1881-1973)

Fotini Koussiaki
RCA/V&A Conservation (with the Tate Gallery), MPhil student, Picasso's materials and techniques

"I can hardly understand the importance given to the word
research in connection with modern painting.
In my opinion to search means nothing in painting.
To find is the thing.
Nobody is interested in following a man who, with his eyes fixed on the ground, spends his life looking for the pocketbook that fortune should put in his path.
The one who finds something no matter what it might be even if his intention were not to search for it, at least arouses our curiosity, if not our admiration."

Statement by Pablo Picasso, 1923[1]

During the 20th Century, an extremely complex change took place in the art of painting. Creative adventure was redefined and visual experience developed in new ways. The manufacture of synthetic materials provided artists with an enormous range from which to choose and allowed them to explore new territories technically. Different resins were tried. Three of these became the most important classes of synthetic resins that developed during the 20th century for use as binding media in paint and varnish formulations; alkyds, acrylics and polyvinyl acetates (PVAs). Along with the range of numerous types of synthetic media, a full line of modern synthetic pigments (both inorganic and, increasingly, organic) also became available to paint manufacturers. A project to study the influence that synthetic painting materials had on the technique of Pablo Picasso is underway at the Tate Gallery. This is the subject of my MPhil research. My research strategy is to subject fourteen Picasso paintings from the Tate's Collection to a strict programme of examination and detailed analysis (Figure 1). In addition, a number of paintings from other museums and private collections are to be sampled.

As early as 1912, Picasso used materials that were commonly used for other well-defined purposes besides fine art practice, such as household or architectural use and even industrial coatings, which he used along with artists' paints. During his cubist period he solved his problem of achieving bright colour by

Photography by Fotini Koussiaki.

Figure 1. Nude Woman with Necklace, 1968, drying oil and oil/alkyd on canvas, 1135mm x 1617mm, Tate Gallery London (cat. no T03670) being examined with a stereo microscope.
© Succession Picasso/DACS 1999

introducing Ripolin (shiny house paint) instead of artist's oil paint. In talking about the Ripolin paints, he named them, "*le santé des couleurs,* (that is why) they are the basis of good health for paints"[2]. The use of Ripolin was an assault on the integrity of the painter's traditional medium. Picasso also influenced many other painters in the use of modern materials. Picasso's techniques and working methods, his justification for his choice of materials and the results of his choices on the appearance of the paintings are the primary subjects discussed. I hope, through the technical analysis of a number of paintings, to be able to indicate the periods that mark transitions for Picasso in which he adopted new materials in his creative expression.

During the 1940s, Picasso's photographer and friend Brassaï, gathered a rich source of information from his notes of visits to Picasso. This is how he described Picasso's order for colours:

"Then the man in the blue suit reaches into his pocket and takes out a large sheet of paper, which he carefully unfolds and hands to me. It is covered with Picasso's handwriting – less spasmodic, more studied than usual. At first sight, it resembles a poem. Twenty or so verses are assembled in a column, surrounded by broad white margins. Each verse is prolonged with a dash, occasionally a very long one. But it is not a poem: it is Picasso's most recent order for colours:

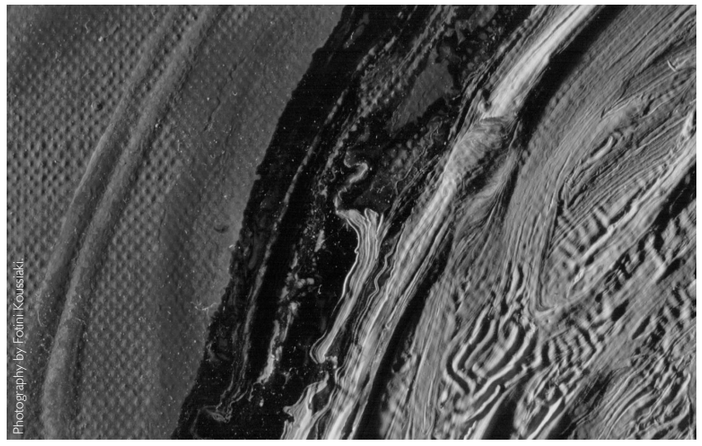
White, permanent----------
argent ----------
Blue, cerulean----------
cobalt----------
Prussian----------
Yellow, cadmium lemon (clear)----------
strontium----------
Lake, madder ----------
blue and brown----------
blue violet----------
Black, ivory----------
Ochre, yellow and red----------
Ultramarine, clear and deep----------
Umber, natural and burnt----------
Red, Persian----------
Green, cadmium, clear and deep----------
Sienna, natural and burnt----------
Green, emerald----------
Japan, clear and deep----------
Veronese----------
Violet, cobalt, clear and deep----------

It made one think of Rimbaud's 'Les Voyelles'. For once, all the anonymous heroes of Picasso palette trooped forth from the shadows, with Permanent White at their head. Each had distinguished himself in some great battle – the blue period, the rose period, cubism, 'Guernica'… Each could say: 'I too, I was there…' And Picasso, reviewing his old comrades-in-arms, gives to each of them a sweep of his pen, a long dash that seems a fraternal salute: 'Welcome Persian red! Welcome emerald green! Cerulean blue, ivory black, cobalt violet, clear and deep, welcome! Welcome!"

Brassaï's notes, Thursday, November 18, 1943[3]

In an attempt to identify the materials that Picasso used in making these paintings, samples have been taken for analysis. The analysis of synthetic painting materials is not widely established, in contrast to the traditional ones. However, the Tate has recently developed analytical techniques that are capable of identifying such materials. Analysis of pigments and extenders is underway in the Tate's Science Section, by making cross-sections and dispersions for ultraviolet fluorescence microscopy, microchemical colour reactions, energy dispersive x-ray analysis (EDX), and X-ray diffraction (XRD) analysis. Binding media in Picasso's paintings are characterised by pyrolysis-gas chromatography-mass spectrometry (PyGCMS) and Fourier transform infrared spectroscopy (FTIR). The problem in identifying early 20th Century housepaints lies in distinguishing them from oil paint, as both were based on linseed oil. Later alkyds also derived from oil and, moreover, sometimes they were mixed with oil on the artist's palette before the application to the canvas[4] (see Francesca Cappitelli's article in this issue of the V&A Conservation Journal).

Besides the identification of the components of a great number of samples, the information that I find most helpful comes from their origin. Picasso was a master of painting techniques; if he was using traditional materials but found an area that required a paint of extra brilliance, he would simply add medium or change the type of paint that he was using (Figure 2). Sometimes he would simply squeeze from the tube the first colour he found on his table. Consequently, the analysis of the media in several colours from the same painting, shows that several types of colour were used in each. Observing the painted surface under the microscope in order to devise the sampling strategy, I came to respect how his choice of materials is inseparable from the visual authenticity achieved in each painting. An understanding of the complexity of the surfaces is crucial, as Picasso didn't follow a systematic application of successive paint layers to the stretched canvas.



Photography by Fotini Koussiaki

Figure 2. Detail of wrinkling colours in Nude Woman with Necklace, Tate Gallery London
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The comparative study of photographs taken of each work, within the visible, infra-red (IR) and ultraviolet (UV) section of the spectrum as well as the X-ray, properly confirm Picasso's comment:

"The old days' pictures went forward toward completion by stages. Every day brought something new. A picture used to be a sum of additions. In my case a picture is a sum of destructions. I do a picture – then I destroy it. In the end, though, nothing is lost: the red I took away from one place turns up somewhere else."

Statement by Pablo Picasso, 1935[5]

What began as a preliminary investigation of materials and techniques led to a thorough appreciation of Picasso's technical skill.

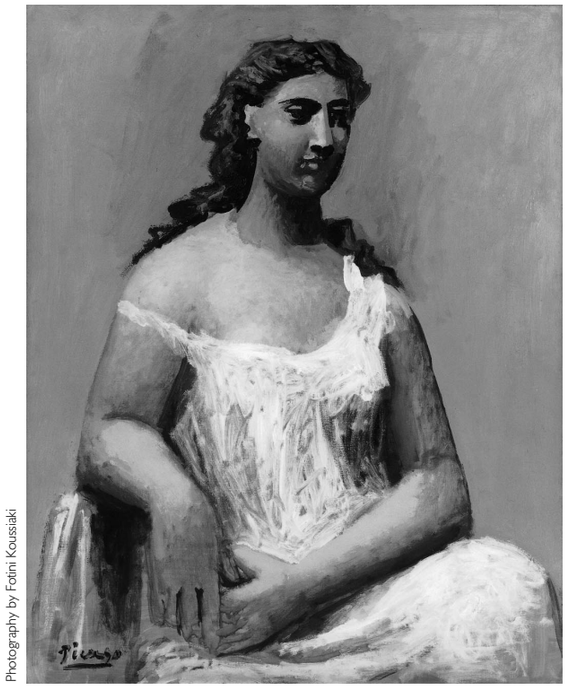
Picasso had no desire to hide the process of painting[6]. In most cases he left visual clues on the surface of the final painting. Often the alterations that were made in a painting could be first detected by using simple visual methods like raking and transmitted light or by a more detailed observation using a simple microscope. The result of an alteration on the painting may be observed as a certain crackle pattern, a different colour showing through a crack or an unusual anomaly on the surface.

To confirm observations that are the result of his active brushwork, infrared light and X-rays are used to penetrate the visible image. Comparison of the x-radiograph mosaics and the infrared photographs with the visible image of the paintings often surprises by revealing not only paint changes but also a hidden image (Figures 3-5).

Are we entitled to uncover an image that the artist reworked for some reason? Knowledge of an earlier painting or a previous version, enables researchers to follow in their imagination the steps that the artist took in realising his inspiration. Picasso expressed his thought about this, giving us the green light!

"It would be very interesting to preserve photographically, not the stages, but the metamorphoses of a picture. Possibly one might then discover the path followed by the brain in materialising a dream."

Statement by Pablo Picasso, 1935[7]



Photography by Fotini Koussiaki

Figure 3. Picasso, Seated Woman in a Chemise, 1923, oil on canvas, 922mm x 730mm, Tate Gallery London (cat no N04719).
© Succession Picasso/DACS 1999

Photography by Marcella Leith

Figure 4. Seated Woman in a Chemise, in raking light.
© Succession Picasso/DACS1999.

X-radiography by Mark Heathcote.

Figure 5. X-radiograph mosaic of Seated Woman in a Chemise, showing an earlier version of the painting, incorporated into the hands of the figure in the final painting.

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THE CONTEMPORARY CHALLENGE

Brenda Keneghan
Polymer Scientist, Science and Information

The word 'contemporary' is on everyone's lips but what is it all about and how will it affect the Conservation Department? According to the Director's Council residential held at Stilton in December 1998, the contemporary is about 'NOW'. This concept is backed up in a more practical sense by the Museum's corporate plan for 1998 – 2002, which states that at least 50% of new acquisitions will be contemporary. As far as the Conservation Department is concerned we define contemporary as the last 10-20 years. Many objects from this period have already been acquired by various Collections and many of them have been made of synthetic polymers. Unfortunately, some of these modern polymeric objects have been the cause of conservation problems. These issues were described in an earlier edition of this Journal[1].

The root of many of the problems lies in the fact that it is the nature of the plastic to degrade quite quickly in comparison to more traditional materials. Quite often the designers of these objects do not fully understand either the materials or production techniques, and experiment with both. On some occasions it is actually the artist's intention that the object will not last. Figure 1 shows an object from the National Art Library which is an example of contemporary book art. The object is an issue of SMILE (an art magazine) made in 1985 and acquired by the NAL in 1993. The artist had invited his friends to send contributions through the post, to an issue of SMILE. He then collated the contributions. The result is a collection of transparent polyester and polyethylene leaves with images and text either printed or collaged. These were then stapled together, rolled up and placed inside a two litre polyester bottle which had a zip at the shoulder. A latex condom decorated with pictures of babies, was also placed inside the bottle. The condom had already begun to degrade when the object was acquired and small pieces of latex have collected at the bottom of the bottle and under pressure-sensitive tape. This object has been described as "a conservator's nightmare"[2], but although it is an extreme case, it does illustrate the challenges faced by a plastics conservator.

With the advent of the contemporary, we can expect an increase in the number of acquisitions made from polymeric materials. However, we are now much better prepared for them. Over the past seven years the Museum has been at the forefront of research into polymer degradation within the Collections. A survey of plastic objects in many of the Collections has been undertaken and the individual polymers most likely to deteriorate have been identified. Preventive conservation measures have been applied with some success and investigation continues into interventive treatments. A series of educational workshops for staff on plastics and their properties is planned. Although there is no absolute solution to the problem of polymer degradation, we are now in a strong position to anticipate the potential problems associated with various materials and make more informed acquisition decisions. We must not fear modern synthetic materials but use the fruits of our research to conserve the contemporary for future access.

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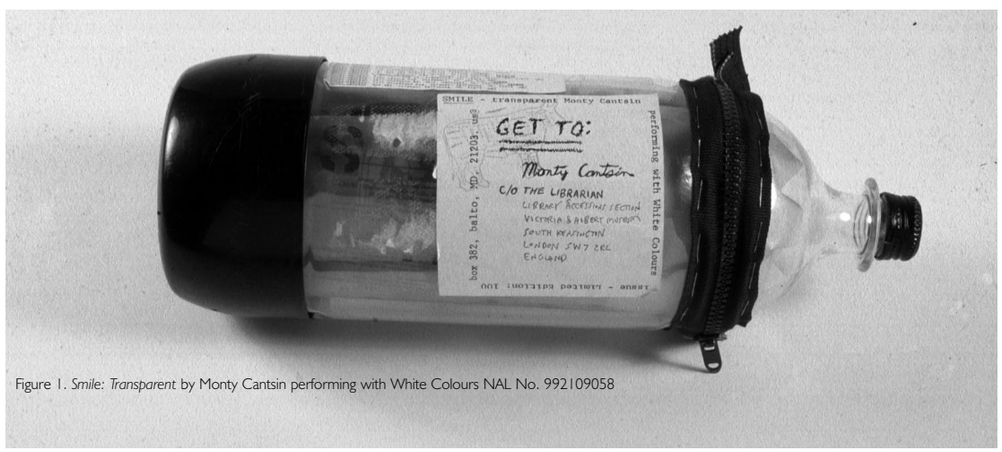

Figure 1. *Smile: Transparent* by Monty Cantsin performing with White Colours NAL No. 992109058

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