

Discovering physical objects: Meeting researchers' needs

A Research Information Network report

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An examination of the material collected from the Neolithic site on the Island of Westray.
From Behind The Scenes (1987) by Dr Lawrence Mound. © The Natural History Museum, London

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Summary



A Parthian horseman, leaded bronze belt buckle, Parthian, 2nd-3rd century AD © The Trustees of the British Museum

The study of physical objects and artefacts plays a core part in research in a wide range of subjects and disciplines. Researchers need to discover and gain access to objects, as well as to publications and the data relating to them. Museums have traditionally played an important role in supporting research, but sustaining these levels of support is becoming increasingly difficult as curators face increasing demands on their time.

Museums have traditionally played an important role in supporting research, but sustaining these levels of support is becoming increasingly difficult as curators are facing many other demands.

This report looks at how researchers in four disciplines (archaeology, art history, earth sciences, and social and economic history) find out about collections of objects relevant to their research and at how museums and other organisations are trying to assist them in their search.

Researchers' needs

The evidence gathered by the report, shows that:

- researchers want online finding aids that enable them to plan their visits to museums and collections and to see and, where possible, to handle objects for themselves
- researchers use a variety of methods to find out about objects that might be relevant to their research, but contact with curatorial staff is crucial
- most researchers are unaware of the online catalogues that have been, and are being, developed by museums and other organisations, and
- researchers believe that there is a lack of consistency in the arrangements that different museums make for direct access to objects.

What researchers need above all is online access to the records in museum and collection databases to be provided as quickly as possible, whatever the perceived imperfections or gaps in the records. This is an essential first step towards improving discovery services that will benefit researchers as well as other users. The traditional reliance on the expertise of specialist curatorial staff to be the key finding aid is no longer sustainable due to the pressure that their extended roles now place on their time. Once records are available online, technological developments that allow researchers and others to easily add to and amend the content of these records, have the potential to help all museums and other collections to improve the quality of their records.

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Museums' perspectives

A number of museums have begun to develop online finding aids, though our study suggests that in doing this, only a few have the needs of researchers in mind. The UK-wide services currently available do not yet provide the detailed information researchers need. The People's Network Discover service has great potential, but its usefulness will depend on the willingness and ability of individual museums and other collections to make their records available online.

Our study shows that many museums seem reluctant to put their records online: because of large cataloguing backlogs and because of concerns about records being inaccurate and/or incomplete. Many curators over-estimate both the resources they need to make existing information useful to researchers and the technical barriers to putting their records online in their current state. They also under-estimate the value of those records to researchers.

Technological developments offer opportunities for cross-searching, for making records findable by Google and other search engines, for linking to associated documentation, and for integrating museum catalogues with other resources, such as library catalogues. In order to realise the potential of the beneficial changes that are now being offered by technological and related developments, the museum world may need to encourage more openness, more sharing and more collaboration.

The report recommends that the Museums Libraries and Archives Council (MLA) should work with funders, the Collections Trust and other agencies to encourage and support projects that develop and enhance quality online catalogues and encourage collaboration between researchers and museum staff. Better communication and collaboration between researchers and curators offers huge potential for enhancing information and services that will benefit researchers and the wider community.



The report's main recommendations are:

- 1. Getting catalogues online quickly:**
All museums and other collections should make the research data in their content management systems available online as soon as possible, without waiting until backlogs are cleared or records improved to levels of perceived 'perfection'.
- 2. Clear and open policies on access:**
Museums and other collections should develop and publish on their websites a 'researchers' charter', including clear policies on the arrangements for visits by researchers and covering other areas such as the support and facilities available for browsing collections, handling objects, sampling and testing, and loans.
- 3. Clarification on the nature and quality of catalogue records:**
All online catalogues and portals should make clear on their website's home page the nature and scope of their records.
- 4. Dealing with backlogs and enhancing existing records:**
When dealing with backlogs and enhancing existing records, curators should establish, with advice from researchers where



Enlightenment Gallery 2003
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possible, clear criteria for determining whether and in what circumstances collection-level or group, as distinct from item-level, descriptions are appropriate.

5. Including images and contextual information:

Online catalogues should, wherever possible, include images, notes about and links to, sources of relevant contextual information.

6. Engaging with researchers:

Researchers should be encouraged to submit amendments and enhancements to catalogue records, and curators should establish systems for handling such input from researchers, including using Web 2.0 technologies where appropriate.

7. Cross searching and linking:

All online museum and collection databases should be made available for cross searching through the Collections Trust/Culture 24 Integrated Architecture Project.

8. Raising awareness and exposure to search engines:

Museums and other organisations should take active steps

to make researchers aware of the nature and value of their current and new online finding aids. Museums need to work with collections management software suppliers to ensure that their records are findable through Google and other search engines.

9. Funding and collaboration:

MLA and Collections Trust should work with funders and other agencies to encourage and support projects to develop and enhance high-quality online catalogues and particularly those that involve collaboration between researchers and curators responsible for several collections.

10. Linking library and museum catalogues:

MLA and other agencies should work with museums and libraries to explore the potential for linking databases of objects and of textual information.

1. Introduction

1.1 Context of the study

Many researchers across a range of disciplines need access to collections of objects and artefacts for their research. Such objects and artefacts may be found in national or regional galleries and museums, or in smaller local museums. Universities themselves are responsible for some major museums as well as for many smaller specialised collections.

In recent years, through Renaissance in the Regions and other initiatives at both a national and local level, much has been done in digitising objects and improving online access to collections across galleries and museums. In addition, work has been undertaken to develop national finding aids such as Cornucopia and MICHAEL and these services have played an important part in enhancing access for many different kinds of audience. But to meet the needs of researchers to access relevant collections and examples of objects and artefacts, and for scholarly information about them, it is widely recognised that much more remains to be done.

In 2007, the Research Information Network (RIN) commissioned Evidence Base at Birmingham City University to investigate these issues in more detail. The broad aims of the study were:

- to review the availability, scope and quality of finding aids to enable researchers across a representative range of disciplines
- to discover information about collections of physical objects and artefacts that may be of relevance to their research, with particular reference to collections in the UK
- to investigate how researchers currently find objects for use in research and identify barriers to the search process, and
- to examine the use and perceptions of finding aids and discovery services by researchers, including any key gaps in coverage or scope.

Bronze Age Hoard from Throston
© Society of Antiquaries of Newcastle upon Tyne



1.2 Approach

Data collection

The study was conducted primarily through desk research and in-depth interviews with:

- researchers in four subject areas
- representatives from strategic organisations
- key officers in relevant museums and collections, and
- staff working on relevant projects in the area.

A total of 57 researchers of postdoctoral standing were interviewed in addition to 10 PhD candidates. Appendix 1 provides more detail of the methodology employed.

Scope

The study focuses on four areas of study chosen to provide a range of subjects and disciplines in the UK, and to take account of possible differences between them:

- archaeology
- art history
- social and economic history, and
- earth sciences, including palaeontology.

Definitions

Finding aids and resource discovery services

Adapting the definition used in *Researchers and discovery services: Behaviour, perceptions and needs* (RIN, 2006), resource discovery services can be defined as “...the means that researchers use to discover and locate objects and artefacts that might be relevant to their work”. This report uses the definition of a finding aid given by May Chang as a “...descriptive access tool (such as an inventory, index, or guide) created by archives, libraries, and museums to locate source material” (Chang, 2000).

Researcher

For the purposes of this study, the focus is on researchers defined as ‘postdoctoral level staff employed by higher education institutions’, along with PhD candidates. This focus excludes many who would fit under a broader definition of researcher, including those outside higher education, local studies groups and students.

Collection-level description

A collection may be viewed as the total holdings of a museum, or a specific group of objects within it, arranged either by subject (archaeology, art history, etc), medium (pottery, prints, etc), donor, collector, or by another grouping appropriate to a particular museum. A collection-level description provides a broad subject breakdown of a museum’s holdings based on any of these groupings.

Item-level description

A description of a specific item held within a collection, for example a painting, artefact or object.

Bulk-level cataloging

The practice of grouping together for cataloguing purposes items of a similar type where an individual item level description is not considered necessary, for example a box of sherds.

2. Researchers and museum trends

This section describes some key trends in the relationships between museums and researchers.

2.1 The changing role of museums

The traditional role of museums centres on the acquisition, conservation, curation and exhibition of objects and artefacts. Many museums have grown from private collections built up by scholars, and therefore research and scholarship have been fundamental to their mission. Academic researchers have been among the primary users of museums, and curators have often been scholars in their chosen fields.

While the study of objects and artefacts has remained fundamental in several academic disciplines, the nature of that study has changed over the years. Modern scholarship is evolving, with new ways of looking at, and re-interpreting, collections of objects built up by previous generations. In disciplines such as archaeology and art history, there is evidence of renewed interest in object-based research. New areas in social and economic history are encouraging a fresh approach to the study of objects of the past. Academic research interest in museum objects remains as important now as it was in earlier years.

For museums, in recent years, new elements have been added to their traditional role as this definition from the International Council of Museums (ICOM) illustrates:

A museum is a non-profit making, permanent institution in the service of society and of its development, and open to the public, which acquires, conserves, researches, communicates and exhibits, for purposes of study, education and enjoyment, material evidence of people and their environment.

This emphasis on a wider role for “study, education and enjoyment” for museums may conflict with the traditional support given to research and scholarship. The Department for Culture, Media and Sport (DCMS), makes no reference to research or scholarship in its four priority areas for museums:



Grinding sugar cane in a windmill.
From drawings made by W. Clark, etc. 1823.
© The British Library

- ensuring that children have the opportunity to enjoy a vibrant cultural and sporting life
- opening institutions to the widest possible cross section of people
- ensuring that the creative, leisure and tourist industries provide the maximum possible benefit to the economy, and
- ensuring our museums and galleries are exciting, modern and provide real value for money.

Against this background, museums have been under pressure to broaden their audience beyond traditional user groups. As a result, for many museums, academic researchers, who do not contribute significantly to visitor numbers, are not viewed as a key target audience. Even in university museums, widening participation and visitor development have become increasingly important in recent years.

Museums have been under pressure to broaden their audience and to focus on widening access beyond traditional museum user groups.

The report *Lifting the Veil* (Museums and Galleries Commission, 1999), examined the state of research and scholarship in UK museums and galleries. It found that research in museums had

“come under new pressures and closer scrutiny” as a result of changes in both funding arrangements and the aims and objectives of museums. A greater emphasis on customer service meant that traditional scholarly activities no longer occupied a ‘pivotal position’. In another report commissioned by the MLA and the National Museum Directors’ Conference (NMDC) in 2006, Tony Travers points to the potential danger to museums’ support of academic research:

The precise nature of the relationship between the large public-facing museums and galleries and the complex science of maintaining exhibits and promoting scholarship cannot be ignored. There is a clear danger that the many demands placed on institutions will, unless resources rise to match expectations, undermine traditional scholarship. It is not impossible to do many different things simultaneously. However it will be increasingly costly to do so. (Travers, 2006)

There are concerns as to whether many museums now see developing resources to support researchers as a priority. Museums are of different types, with different funding mechanisms and different priorities, and researchers are only one of the many groups they serve.



Tektites are terrestrial objects that have been produced in an impact event. They are centimetre-sized pieces of natural glass formed by atmospheric quenching of impact melts.

© The Natural History Museum, London

2.2 Improving links between researchers and museums

Despite these competing demands, there is scope for further collaboration between museums and researchers. Recent studies have begun to emphasise again the importance of the use of collections in research. *Collections for the future* (Museums Association, 2005), recognises that some collections will be of interest mainly to researchers, rather than the general public:

Of course, some collections are intended primarily as a resource for specialist researchers; but even research collections have to be promoted if they are to reach a wide range of specialists.

In *Fragments of the World*, Suzanne Keene (2005) identifies research as one of the four perspectives from which collections can be viewed. She argues that more collections-based research would help to demonstrate and enhance the value of collections, especially when those values are not obviously economic ones. She urges museums to see services for researchers as a central function, with research provision effectively marketed.

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The MLA’s Designation Challenge Fund (DCF) and Renaissance in the Regions programmes have enabled several museums to develop online resources, to the benefit of researchers as well as other user groups. Within the changing environment of museums themselves, research still occupies an important place. A report commissioned by the NMDC on the value of national museums (Travers, 2004) pointed to the number of articles in refereed journals written by museum staff.

For museums in the university sector, there is often a special focus on supporting researchers. However, a survey of museums and collections in higher education institutions in the Midlands, *Totems and Trifles* (Arnold-Foster and Weeks, 2000), found that while teaching or research was still a main function for most of them, a number had no significant connections with teaching

and research activities. Developing better connectivity between university museums and the research and teaching missions of their universities has been a key theme of Arts and Humanities Research Council (AHRC) policy in its provision of funding for university museums. A number of them have made renewed attempts to realign their role with that of their host institution, and to emphasise their commitment to research, through such mechanisms as joint appointments to museum and academic staff (e.g. at the University of Manchester).

All museums continue to seek ways of making their collections accessible to a wider audience, but they recognise that they also have a responsibility to meet the more specialised needs of researchers. Gathering and exploiting new sources of information about their collections, and developing new finding aids are potentially fruitful areas for collaboration between museums and researchers. Such collaboration has the potential to produce benefits to the wider public as well.

Gathering and exploiting new sources of information about their collections, and developing new finding aids are potentially fruitful areas for collaboration between museums and researchers.

3. Researchers' needs

While the study of museum objects and artefacts has remained fundamental in several academic disciplines, the nature of that study has changed over the years. This section draws on in-depth interviews with researchers to provide their perspectives on finding objects relevant to their research, and their use of, and expectations for, online finding aids.

3.1 The importance of accessing the 'real thing'

In all four subject areas, researchers stress the importance of seeing and handling the objects themselves, rather than relying on a description or a digital image.

It is nearly always a case of finding out where something is and going to take a look.



Hafted stone axe from Robehausen lake-dwelling
© Wellcome Library, London

I wouldn't dream of talking about an object if I hadn't seen it.

Looking at things in reproduction...is inevitably an impoverished experience.

An important reason for engaging with the object itself includes the additional information that can be gained from handling:

There is something very particular about the handling of an object, being able to examine it, turn it upside down, feel the weight, for you to understand it. Until you have actually held an axehead in your hand you wouldn't know that it fits the hand very well....when you see a picture of an iron age torque you need to feel the weight to know you couldn't wear that all day as you'd get a headache, so its ceremonial.

In some cases, particularly in archaeology and earth sciences, handling is not enough, and researchers may wish to sample materials for analysis, to see how they have been made. This might include destructive sampling, which will of course present challenges for museums.

Some researchers also see a need to re-interpret older descriptions in the light of new evidence and new knowledge, and to see for themselves that the descriptions provided by museums are accurate. Some will go further, to challenge and subsequently enhance information provided by museums as a result of their own engagement with the objects in question:

My work is on artefact studies, pushing forward knowledge of the object. You have to treat the information with a bit of 'disrespect' and look at the actual artefacts

This is a view echoed by some museum curators:

Nearly all researcher enquiries will result in a visit. If you are doing anything that involves classification or typology, a researcher will want to see the object, as most will not trust drawings, photographs or secondary sources of information.

Many researchers also feel that visiting to view an object sets it in context and might provide links to other related objects. This can provide an important element of serendipity where additional objects are found to have value alongside the original

one a researcher was searching for. Further details of researchers' experiences and expectations in visiting museums to access objects are presented in section 3.4.

In social and economic history, some researchers feel that objects are important because there are few written records available or there are gaps in other types of evidence such as oral testimony. For researchers interested in the history of material culture, the study of objects is central to their approach. There is evidence in many subject areas of a growing interest in how objects were made and in the social context in which they were used. For researchers interested in such approaches, traditional finding aids which rely on a description of the object, its size and what it was made of may no longer be adequate. For almost all researchers, however, a full description of the object is not a substitute for a visit to view the objects relevant to their research. They need to identify which museums have relevant objects so that they can plan visits.

3.2. Approaches to finding objects

Researchers who wish to study artefacts and objects first have to find what objects are available and where they are currently held, before deciding whether to arrange to see them. This section reports on how researchers set about finding and locating objects, the most common methods being through direct contact with museums and through references in scholarly literature. Most researchers, however, use a combination of methods.

Contacting museums directly: The curator's role

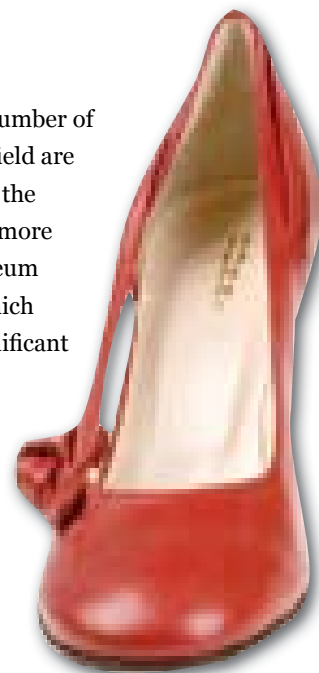
The most frequent way of finding out about objects is through direct contact with one or more museums, or by making a preliminary visit. Sometimes, researchers approach museums based on 'common knowledge' of where they might expect an object to be. In other cases, they contact a wide range of museums by email, letter or phone. If the museum does not have relevant objects, researchers often expect a curator to recommend other museums to approach. Museum curators play a significant role in assisting researchers to locate objects. It is thus a cause of frustration to some researchers that contact details for curators are difficult to find on museum websites. More experienced researchers often have longstanding links with particular curators:

You get contacts through talking to other people. For example, someone says, 'You must talk to...'. You find out about smaller collections especially in this way.

Curators who have been in post for a number of years or are specialists in a particular field are valued for their in-depth knowledge of the collections and their ability to provide more information than can be found in museum catalogues. The one-to-one support which many curators provide is seen as a significant strength of museums:

They [curators] are the invisible resource...intangible assets.

Curators are very important because objects are less directly readable than an archive.



Many researchers are aware of the importance of framing their queries as precisely as possible in order to get the most out of the curator's time. This may involve obtaining information from other sources such as a reference in a journal, a photograph or digital image. Then, prior to a visit, a curator might be able to send a catalogue extract to provide further information for a researcher, so an object's relevance can be assessed for research relevance and value. This direct approach is time-consuming, but most researchers regard it as highly effective.

Using scholarly literature

For many researchers, the scholarly literature provides an important source of information about the location of objects relevant to their research. For this approach to work effectively, it is clearly important that past research relating to objects is well documented, with links to any published research papers being included in the object record in the finding aid (this is further explored in section 3.5). In earth sciences in particular, scholarly articles provide an important source of information about where objects are located, as there is a long-standing requirement that any object described in an article accepted for publication should be deposited in a museum and that the article should carry a museum accession number. This helps future researchers to follow up and build on previous work. But it is not a requirement in the other subject areas we investigated.

Printed catalogues and guides

Some researchers use printed guides to locate objects. These include individual museum guides and catalogues, those



Court Shoe, 2005
© Discovery Museum, Tyne & Wear Museums

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covering a number of museums in particular subject areas, and the comprehensive Museums and Galleries Yearbook. Some researchers mentioned the series of surveys of museums and collections in the higher education sector undertaken for the Regional Museums Councils in the 1990s – see, for example, *Beyond the Ark: Museums and Collections of Higher-Education Institutions in Southern England* (Arnold-Foster, 1999) – and subject specific guides, such as the *Register of Natural Science Collections in NW England* (Hancock & Pettitt, 1981). In palaeontology, the main reference source is *World Palaeontology Collections*, last published in printed form in 1986 and now being updated in electronic format. In archaeology, the Council for British Archaeology (CBA) research reports, or other project or subject studies, often provide details on museum holdings. But such guides, where still available, are often out of date.

Personal contacts and networks

Many researchers use personal contacts and professional networks in their subject area as a means of finding out about objects. These include postings onto professional networking sites, finding out information from a colleague, or discussions at conferences. Researchers with many years' experience in a specialist field amass a great deal of knowledge about objects and where they are located. They pass this on to students as part of their doctoral training:

I'm now well advanced in my career, and I know where to go. A young researcher would be advised by their supervisor where major collections are and would expect, by the end of a PhD, to have all this information.

Some acknowledge, however, that their reliance on their existing knowledge and familiar sources may make them less inclined to look outside the collections with which they are familiar.

Visiting museums: An element of serendipity

A few researchers use the approach of visiting and physically trawling through a collection to find what they require. This may work well for a preliminary visit, particularly where objects are not well catalogued:

I just assumed all museums in the south were relevant, as everyone has something. I went to look, and found something they didn't know what they had.

Such an approach can prove both time-consuming and unreliable. Many museums do not allow such browsing, particularly without prior warning, and so exploratory visits may thus be limited to items on display. But the approach can lead to unexpected rewards:

I went basically on spec. using trial and error. For example, I went to the...museum to look for Roman materials that I thought they might have. They didn't have much, but quite by chance I found the key piece of evidence I required. It was just luck that I found it.

Happenstance and serendipity remain important as means of discovery:

Objects have found me! Ideas can be triggered by events such as a conference or tangential reading...If you're looking for A you tend to find B, C and D along the way and you store them away to explore when you have the opportunity.

Building up personal and institutional collections

Palaeontologists and earth scientists commonly build up their own collections of specimens (and some use commercial sources such as the Mineral Gallery to identify objects) that they then hand over to museums or to their university department on completion of their research. Similarly, in art history and social history, some researchers work with types of object, such as everyday artefacts from the recent past, that are not yet readily accessible in museums. They often build up their own collections of such objects; but unless these are passed on to museums, they will usually be very difficult for other researchers to trace.

3.3 Use of online finding aids

Many researchers developed their information-finding strategies well before the emergence of online finding aids. But particularly when they start to research new areas, they increasingly include online search tools as part of their search strategy. Several researchers said that they would start with Google, even though it is unlikely at present that they would pick up museum collections from a Google search.



Bone knife from Papua New Guinea
© The Natural History Museum, London

When asked about finding aids which provide collection-level descriptions of museum holdings, a number of researchers said they had heard 'vaguely' of Cornucopia. But only a small proportion were able to comment on its usefulness, because they had not actually used it or could not clearly remember doing so. Just one reported finding it particularly useful, although others said Cornucopia or the 24 Hour Museum had helped in minor ways such as finding contact details. Others felt it might be useful for students or less-experienced researchers:

Possibly if someone was new to research and knew this facility existed, it might be useful. I wouldn't use it, I'd go to the literature and from this know where material is deposited and then go to the museum.

We found little evidence of researchers making use of the online finding aids currently available. They are generally aware of online databases produced by their own institution or by museums they use regularly, and a few also mentioned subject-

specific online finding aids such as ARTstor, FENSCORE and the Portable Antiquities Scheme (PAS). But most preferred the direct and personal approach to searching a museum's collection.

Lack of awareness is clearly a factor in researchers' low use of the available online finding aids.

Lack of awareness is clearly a factor in researchers' low use of the available online finding aids. Some feel that little is being done to make them aware of the recently-developed services, and most who have used them found them by chance:

There are useful sites and tools out there, but you just tend to stumble across them if you are lucky.

A few researchers looked up Cornucopia (often for the first time) in the course of our interview, and some found something of interest, though not always related to their main research area:

It's a useful starting point, not for me at this stage, but for those starting a PhD to get an initial sense and then establish their own contacts. The list of museums helps remind me of those I haven't visited, or not for a long time.

I take field trips to Devon and have just seen there's a geology collection in the museum in Torquay. I had no idea it was there.

Others noted that some collections in their specialist areas were not included, and that focusing on a museum's 'star exhibits' was not helpful:

What's needed is something where you can access lots of collections at once, especially those you may not have heard of.

3.4. Physical access to objects

Simply finding that an object exists and where it is located is, of course, only the first stage in a research process. Most researchers then typically need access to the objects themselves, in order to examine them and assess their significance and value to their research.

Expectations

Researchers have a wide range of requirements for access to objects, depending on the nature of their research. These may include:

- simply looking at a single object from all angles
- looking at an object and associated documentation and data
- looking at other objects that may be held in proximity
- handling the object
- undertaking sampling analysis of an object (sometimes resulting in its destruction).

In addition to access within a museum, some researchers expect to be able to borrow materials for research purposes. In palaeontology and archaeology in particular, researchers may request long term loans of objects for the purpose of chemical analysis.

Most researchers feel that it is important to 'prove' to curators that they have done all that they can to find out about the object prior to their visit, believing that specific enquiries are greeted more sympathetically. This highlights the important role that high-quality finding aids can play by enhancing the information available before a researcher undertakes a visit.



Entomologist studying beetle specimens
© The Natural History Museum, London

It's important to be focused. Ask for something specific to demonstrate you've done everything you can before seeing the object.

You need to do your homework first rather than expecting museum staff to do your research for you. Curators respond better to an informed enquirer.

Some researchers expect to be able to browse rather than just having to look at a single object, both as an aid to the research process and to encourage serendipity:

It's important to be able to meander through the world of the object. The historical or scientific order is just one way of looking at things.

...the advantages of browsing – a bunch of fossils may be put in the collection, no-one knows much about them and then you find it may be in the wrong drawer and is a different species. 'Serendipitous discoveries' happen often.

For many researchers, the opportunity to engage with an expert curator is a significant benefit from visiting a museum to gain access an object and many museum curators value the contact with researchers to enhance their own knowledge and perspectives.

The level of support which researchers expect or require from museum staff varies. Some simply expect museum staff to retrieve objects they need. But others value the input of curators as experts with deep knowledge of the collections in their field. The opportunity to engage with an expert curator is a significant benefit derived from visiting a museum. Curators may suggest further objects to look at, or put researchers in touch with others undertaking related research. Many museum curators value the contact with researchers to enhance their own knowledge.

Access arrangements and policies

The arrangements and resource that museums can offer to assist researchers in accessing objects vary hugely. We identified some common barriers and challenges to access as well as examples of good practice. The main barriers are:



Flint from Eltringham (Palaeolithic)
© Society of Antiquaries of Newcastle upon Tyne

You have to make sure museum visits will be useful. The more electronic and visual information you can get at to start with, the better.

It's useful and interesting to go to museums, but not always productive. I went to...Museum but didn't then use it for my research. They didn't know what was there and didn't have an electronic catalogue - so they said come and see what we've got.

Researchers expect basic information such as contact details to be accurate and up to date, and to be sure that general finding aids such as Cornucopia cover all museums with collections relevant to their research.

Researchers expect basic information such as contact details to be accurate and up to date, and to be sure that finding aids such as Cornucopia cover all museums with collections relevant to their research. The ideal for researchers would be “a publicly accessible online database of all collections”, one where “you can search artefact by artefact down to site level”, and which gives “electronic access with good images”. Researchers are more interested in a resource that allows them to search across individual museum databases rather than having to search each museum separately, but they realise that this will take a considerable time to come to fruition.

Coverage

While comprehensive coverage in online finding aids would be the ideal for researchers, they do not expect it to be achieved in practice, at least in the short term. Moreover, they see finding aids as one useful tool which may be complemented by other ways, including making direct contact with museums.

You don't need to get everything online as long as you can get a reasonable picture and pursue it further from that point.

The key for researchers is a clear indication of what the service does and does not cover, so that they can critically assess the results.

So long as finding aids fall short of comprehensiveness, the key for researchers is a clear indication of what the service does and does not cover, so that they can critically assess the results and make their own judgements as to what other means of discovery need to be used in addition.

Level of detail

Researchers have mixed views on the level of detail required in finding aids: that is, whether item level, collection-level or bulk-level cataloguing is appropriate. For some types of object, collection-level information is of limited value:

Collection-level descriptions are not that useful. You already have a good idea of where the collections are. Researchers need more detailed information...it's definitely object-level information which is of use.

For these experienced researchers collection-level descriptions such as those in Cornucopia are therefore unlikely to be relevant:

I've been in the field for over thirty years, so I'm not at the point of having to find out about collections.

On the other hand, many researchers question whether item-level records are worth the effort involved in all cases. For some categories of objects – for example sherds in archaeology or common fossils in palaeontology item-level descriptions are not thought necessary:

For online catalogues, you would identify important objects, but not all. It should be straightforward to establish which things are key and focus resource on getting these findable virtually.

Researchers interested in sampling and browsing may prefer collection-level descriptions, because they believe that with this level of description, it will be easier to get permission to sample. Browsers are interested in the chance of a discovery within a collection. Several spoke of this as an important part of their research:

There's something of the excitement of the treasure trove. For example, I was looking at material from [a particular country] and a tray was pulled out not exactly in the right order, and I noticed material from some other place that was very important.

Level of precision

Although accurate and up-to-date information about objects and collections is also much to be desired, most researchers believe that full and accurate information about objects and collections is unlikely to ever be available. The key requirement is that any assumptions and limitations in the description are made clear in the finding aid. Perfection is unattainable not least because objects have multiple and changing meanings for researchers:

Finding aids can never be perfect. Predefined categories are just one way of describing things – you cannot predict or anticipate all ways of describing an object.

A similar conclusion was noted by the JISC Funded LEMUR project (Learning with Museum Resources). This found that academics from five disciplines, including cultural history and history of art, looked at the same object from different points of view, indicating that the information they required from a catalogue therefore differed too.



Montagne Sainte-Victoire by Paul Cezanne, c1882
© The Samuel Courtauld Trust, Courtauld Gallery, London

Images

Advances in technology are producing opportunities for more sophisticated images, and researchers now expect images to be included in online databases. For some researchers, images are more important than a detailed description.

I would query the amount of detail needed on each artefact – could get round this by showing digital images.

There are a lot of minerals which we suspect are misidentified...We don't know how to present them in the catalogue. This is where an image would be helpful.

From the curator's viewpoint, digitisation can save wear and tear on a fragile object. But most researchers point out that the value of images lies in the additional information they provide, rather than in serving as a substitute for seeing and handling an object:

As good as images are (and they are good now), there's nothing like the actual specimen. You have to prepare material, eg it may be under an inch of rock and have to be pared out. There is nothing like the actual object.

Researchers also find that digital images vary in quality, and there may be specific reasons why they are not currently as useful as they might be:

It's very difficult to get high enough quality images and to be certain of scale, especially when dealing with small things. Images are lit from one direction, and most organisms I work with are in low relief, so difficult to see.

2D images such as paintings, prints or drawings lend themselves more readily to digitisation than 3D objects. This, plus demand from art historians, was the reason why the British Museum chose to start its online collections database with prints and drawings.

Cross searching

The ability to cross-search museum databases is an important consideration for most researchers: objects themselves are more important than the museum in which they are held. Archaeologists and palaeontologists comment frequently on how objects from a single site may end up in a number of different museums. Other researchers similarly need to locate items which may be held in smaller, less-well-known museums.

Subject databases such as Accessing Virtual Egypt and NICE Paintings (see section 4.1) provide aggregations of information about objects held in different museums that can be particularly helpful for researchers seeking to trace objects in unexpected or little-known museums. Archaeologists working with human remains feel particularly strongly about the need for a human remains database, covering an area where regulations may make for difficulties in locating and working with objects relevant to their research.

The growth of inter-disciplinary and cross-disciplinary research presents particular challenges. It means that researchers from different areas are looking at and for objects in many different ways: a social historian, for example, may be interested in how an archaeological collection was put together; or an art historian may be interested in early drawings of fossils. Online finding aids which support cross-disciplinary searching are difficult to create, but they can enhance the potential to make many links between objects outside the traditional subject focus. For researchers in subject areas that do not have a tradition of object-based research, it is particularly important that high-quality finding aids are available to assist them.

Links to contextual and other information

Researchers frequently want more than the basic description and provenance of an object. Information about the history of an object, about its relationships to other objects and about research undertaken relating to it, including resulting publications, is of considerable interest to researchers. Often such information is not easily accessible. Where relevant journal articles have been collected, they may be held by a curator and only in hard copy in an associated file. Frequently such publications have not been collected and held in the museum at all.

For archaeologists, the lack of links between site data and objects excavated is a particular problem:

There is a disjuncture between site-based information and artefact-based information. If you find the artefact in a museum you might not find the site-based information or even any other bibliographic data. And the opposite is true – if you find the site information you may not easily find data about the actual artefact

The problem is that objects are catalogued with no particular reference to the context in which they were excavated. If the only number I have is an accession number, it doesn't tell me what grave it's associated with, what skeleton, etc. It's important to see items as a group and to be able to reference that in the catalogue.

Many researchers say that links from online finding aids to associated documentation of this kind would add greatly to the value of finding aids.

International scope

Researchers may frequently study objects held in museums across the world and thus face additional challenges in locating information on a worldwide basis. Links between finding aids for UK resources and for objects from around the world would be particularly useful:

There is no central database which has all pterodactyls from all over the world – that would be great.

For researchers in earth sciences the challenge is to be able to analyse information about objects and related datasets worldwide. This can be important when looking at issues such as climate change and weather patterns associated with specific objects on a global scale. For such researchers, finding aids with a worldwide coverage as well as a focus on related data sets would be of great value.

Speedy access to online information

Regardless of the particular features that researchers ideally want in a finding aid, their main priority is to be able to find basic online information about objects as quickly as possible. Even at the risk of sacrificing quality and detail, a central message from this study is that researchers want online access to whatever information is currently available. Museums should not wait until they have updated or enhanced their records before putting them online:

We want museums to get as much information out there as possible, online in whatever format – it doesn't matter about tidying it up or just putting in the bare minimum.

Researchers want online access to whatever information is currently available.

Some researchers stressed that if museums made the information they currently have available online, researchers themselves could enrich it or help to improve its quality:

The only way to enrich data is to expand the number of experts and you have to open up the information and let them in, in their own way and in their own time.

Conclusions

The idea of a research library without an online catalogue, and without a facility to cross-search other library catalogues, is now unthinkable. By contrast, online catalogues and finding aids for objects and artefacts are much less well-developed, and researchers are only dimly aware of those that are being created, and use them relatively little. Most researchers continue to gather information about the nature and whereabouts of objects through other means. When prompted, they can see some value in such tools such as Cornucopia, but they want much more, at the very least of the quality that is being provided by libraries. Ideally, they want to go beyond collection-level descriptions where appropriate, to include contextual information about objects, and to see an image. Above all, they want the information currently available in museum catalogues – whatever its quality – to be put online as quickly as possible, plus the facilities to enable them to search across individual museum databases on a national and preferably, international, level.

Researchers who have been used to inputting their own content into Wikipedia, or to using social network sites, will expect to be able to interact with museum catalogues, adding their own descriptions and amendments to an existing record.

Expectations will continue to grow. Future generations of researchers will expect to find all information online through a

simple search procedure, and will have enhanced expectations about interacting with online sources. Those who are used to inputting their own content into Wikipedia, or to using social network sites, will expect to be able to interact with museum catalogues, adding their own descriptions and amendments to an existing record. And in so doing they will enhance the quality of the catalogues, to the benefit of museums and all their users.



Curator and staff at work: (left to right) Kent Tomey (Clun Museum Curator), Jane Thompson Webb (BMAG: Collection Care Officer), Anthea Henton (Shropshire Flying Collections Assistant)
© Shropshire County Council and Renaissance West Midlands

3.6. Challenges in meeting researchers' needs: Curatorial expertise

It is clear from our study that researchers' needs are being met at best partially and often not at all. This partly results from researchers' lack of awareness of many of the services that are available or being developed, and one of the challenges for the museum community is to publicise these services more effectively. Researchers' subject networks and forums, such as *Paleonet* in the case of palaeontology, would be suitable vehicles for this information. Those museum catalogues that are available online are of variable quality and the scope of their coverage unclear. Moreover, they seldom provide links to other data sources, or enhanced levels of information such as images. One of the biggest challenges relates to curatorial expertise.

Researchers currently rely heavily on specialist curators to assist them in identifying and locating objects relevant to their research, and some researchers spoke to us of the value of a curator with many years experience of a collection. The long term sustainability of this level of knowledge amongst curators

is a matter for concern. There is a widespread belief that many museums, including some of the larger ones, are not employing as many specialist staff as they did in the past; and that curators are taking on ever-greater management and front-of-house responsibilities, as distinct from focusing on research and the support of researchers. When curators with specialist expertise are not available, this can cause problems for researchers:

The material wasn't catalogued and at first the museum said they hadn't got it. A researcher had worked on it in the '80s and had now left. Luckily one of the curators remembered it and thought it must be somewhere. It was eventually located in a store. If that individual had retired or left, no-one would have known.

Both researchers and museum staff agree that it can take many years before a new curator acquires detailed knowledge about a collection:

I notice there is a generational gap now between new staff and retiring staff who are taking a lot of knowledge with them. The younger generation are much more about education and activities and display, while the older generation are more on curation.

Such issues are even more challenging in smaller museums with few members of staff who cannot be expected to have specialist knowledge of all areas of their collections. Where catalogue records are also incomplete, this can cause problems:

If you know it's there, you often have to ask in different ways. The curator has to know how to interpret your questions. This may be difficult if they are inexperienced in your field.

This is a particular problem for researchers in areas such as archaeology or palaeontology where collections have been split among a number of museums, or where material from local excavations is retained in a small local museum:

The bigger collections have a bit more idea, but in smaller museums without specialist curators they wouldn't necessarily know what's what.

Where curators do not have relevant specialist knowledge, there is even more reliance on good online catalogues to lead researchers to the objects relevant to their research.

Where curators do not have relevant specialist knowledge, it is even more important that there is a good online catalogue to lead researchers to objects relevant to their research. Otherwise, there is a danger that important collections, particularly those in smaller museums, will remain hidden and unused. Alongside the available levels of expertise, however, many researchers see the cultures prevalent in some museums as a barrier to meeting their needs:

Museums commonly see themselves as guardians of all materials and information about them, and feel that information cannot be released until it is perfect and true.

Changing such cultures and attitudes as an essential step towards meeting researchers' needs.

3.7. Researchers' contributions to finding aids

Some researchers are collaborating with museums to enhance object records. They often provide copies of articles or other publications, or newly-constructed datasets, resulting from their research. Most – but by no means all – researchers told us that they send copies of such outputs to museums with which they have had significant contact. Indeed, some museums impose on researchers a formal requirement to submit copies of any published work, particularly those including photographs or other images, where the retention of the museum's copyright may be an important issue.

Although information deriving from and about publications would make a valuable addition to any catalogue record, researchers are for the most part unclear how museums make use of it. The main exception here is in earth sciences, where the system of presenting publications to museums is formalised: specimens described have to be curated and given a museum accession number before articles can be published in peer-reviewed journals.

Many researchers contribute to museum finding aids in more informal ways. They may develop relationships with particular museums, where staff may call on them to provide expert advice on specific objects or collections. On a less-regular basis, many researchers provide information in conversations with museum staff about, for instance, dating or examples of related objects in other collections:



A New Geological Map of England and Wales. Image taken from A New Geological Map of England and Wales, with the Inland Navigations; exhibiting the Districts of Coal and other Sites of Mineral Tonnage, by W. Smith © The British Library

.....

I say if I think things have been miscatalogued so the museums can investigate further. Most people are open to this. I've seen curators make notes and adjust data.

With national and university museums in particular, researchers may go much further and establish close relationships with specialist curators through subject or disciplinary networks; they may develop formal partnerships, for example in relation to research for an exhibition and/or the writing of an associated catalogue. In university museums, there are also opportunities for joint appointments to museum and academic posts.

There are particularly close links between researchers in palaeontology and the museums with which they work. One researcher described how he works on objects in his own collection, then when he is ready to publish, contacts the most appropriate museum in which to deposit the objects. This puts the objects in the public domain for future research, and also gives them legal protection.

We identified two recent initiatives that may help to develop such relationships more widely. The first is the AHRC's Collaborative Doctoral Awards scheme, through which doctoral students can work with museums and contribute to the development of finding aids. The role of academic supervisors and their relationships with museum collections and curators are key to the success of such a scheme.

The second initiative stems from the *Feasibility Study for a Sustainable Collections Research Network* produced recently in Scotland (Christie & Gunn, 2007), which considers the development of a network bringing together those working on Scottish collections from universities, museums and galleries and other heritage agencies. The report found that such a network would fill a perceived gap. Initiatives like this could help to encourage researchers to look further afield for project work for themselves and their research students.

Web 2.0: Further opportunities?

More generally, the development of Web 2.0 and related technologies provides further opportunities to enable researchers to contribute to the development of online finding aids. We found a few pockets of activity to develop Web 2.0-enabled databases to which researchers could contribute by annotating and updating records. Many researchers would welcome the opportunity to contribute in this way, and there is clearly considerable scope to exploit such technologies further. This would help museums to fulfil the requirement set out in the *Ethical principles for all who work or govern museums in the UK* (Museums Association, 2008) to:

Keep records and presentations as accurate and as up to date as possible. Record differences of expert opinion. Correct errors in documentation or presentations without delay when they are brought to light.

More generally, it would help to make catalogues more accurate and comprehensive, to the benefit of museums and researchers but also, and critically, to wider museum audiences.

3.8. Key findings

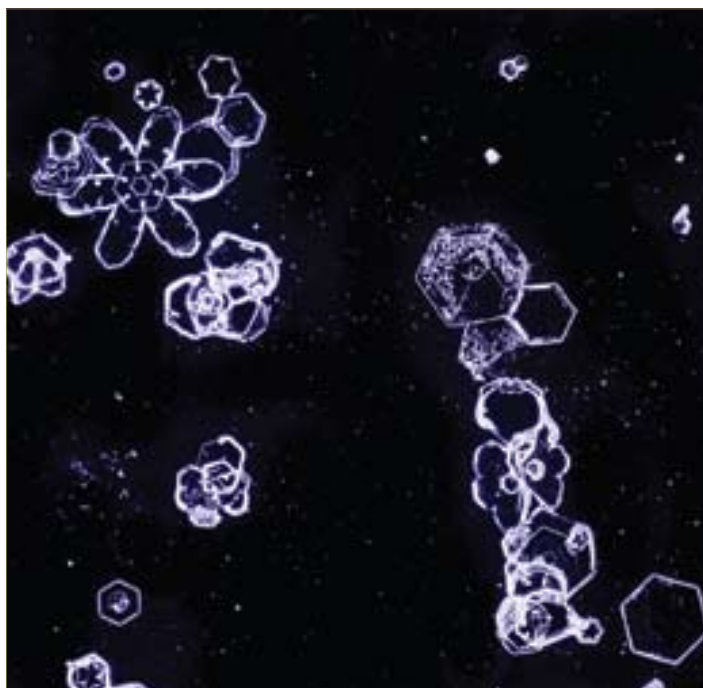
Finding and locating objects relevant to their research remains an essential part of the activities of researchers in a range of disciplines. The efficiency and effectiveness of the services that enable them to fulfil those tasks is of critical importance. From the researcher's perspective, the key considerations that need to be taken into account in the development of such services are:

The primacy of the object: Engagement

For most researchers, the end point of a search for an object is engagement with the object itself. What they want from finding aids is enough information to be able to plan their visits to museums effectively. Digital images may be useful, but they are no substitute for seeing and where possible handling the objects themselves. Such close engagement enables researchers to view objects from all angles, to assess their significance and to challenge the description and data provided in relation to them. In some cases, researchers want to go further and to borrow objects or conduct tests on them, though they recognise that this may not always be possible.

Finding out about objects: Discovery

Researchers use a variety of methods to discover information about objects relevant to their research. These include: contacting museums directly; searching through scholarly literature; searching printed catalogues, museum guides and catalogues; using personal contacts and networks and visiting museums. The most commonly used methods are direct approaches to museums, and following up references in scholarly literature. Researchers rely heavily on specialist curatorial staff to deal with queries and to locate objects for them.



Formvar replica taken on the Avery Plateau during December 1995. Cloud particles about 50-500 microns across. They are mostly hexagonal plates
© British Antarctic Survey

Using finding aids: Awareness

Researchers have so far made little use of museum catalogues and other finding aids, preferring other methods to find and locate objects. They show little awareness of the finding aids that exist or are being developed, and we found little evidence of use of new finding aids such as MICHAEL and Cornucopia or of any subject-specific finding aids.

Early-career researchers, and those starting work in a new area, believe that online finding aids would be of considerable value to them, although some may still initiate their search with Google. Many researchers believe that technological advance and the growth of expertise in the use of search tools are bringing changes in expectations, and that the demand for online finding aids for objects will increase significantly and quickly, particularly amongst newer researchers.

Access to objects: Consistency

Arrangements for physical access to objects vary considerably between museums, and researchers encounter a number of challenges in gaining the access they require. These include limited hours for visits; delays in securing an appointment; lack of museum staff resources to support or supervise a visit; lack of specialist knowledge of the collection; inadequate facilities and equipment; lack of opportunities to browse objects held in store; varied policies on handling and sampling; varied loan policies; objects not being found upon visiting; and inconsistent or overly bureaucratic procedures.

Researchers needs for finding aids: Online access

Researchers' needs for finding aids include quick online access; accurate information; wide coverage; digital images; links to other relevant sources of information, such as research papers, and information about an objects' provenance; and international scope and coverage. They want, where possible, to go beyond collection-level to item-level descriptions, and the inclusion of images. They also want to be able to cross-search all museum databases on a national and preferably international level.

While such desirable features as comprehensiveness and accuracy are important to researchers, most regard them as ideals to aspire to rather than absolute requirements. Above all, researchers are keen that information should be made available online as soon as possible, even if it does not include all the desirable features. Researchers want increased online access to museum databases to be provided quickly rather than waiting for museums to update and improve their records before putting them online.



Conclusion: Challenges and opportunities

Our clear finding is that researchers' needs for information about objects are being met only partially if at all. In part, this results from researchers' lack of awareness of many of the services that are available or being developed, and one of the key challenges for the museum community is to publicise these services more effectively using the networks and media researchers are most familiar with. Those museum catalogues that are available online are of variable quality and the scope of their coverage is unclear. Moreover, they seldom provide links to other data sources, or enhanced levels of information such as the inclusion of images.

Perhaps the biggest challenges relate to curatorial expertise, and to the culture of some museums. Researchers currently rely heavily on the knowledge and expertise of curators, but this may not be sustainable. The many other demands on museums and their curators means that curatorial expertise may become less available than in the past, even in larger museums. Such developments increase the need for high-quality and effective finding aids, so that collections important for research purposes do not remain hidden and unused.

Curatorial expertise may become less available than it has been in the past...Such developments increase the need for high-quality and effective finding aids.

Many researchers also see attitudes in some museums as a major barrier: a culture of guardianship and a belief that only full and perfect information should be made available is seen as stifling access in many cases. Researchers are keen that the best should not be the enemy of the good: while they value catalogues that are comprehensive and accurate, their key requirement is that the assumptions on which an individual catalogue is based, and the scope of its coverage, should be made clear so that users can make critical judgements about the information provided.

Researchers would welcome the opportunity to contribute more. If records were made available online, it would be easier for them to do so.

Researchers contribute information to museums in a number of ways, most notably by providing copies of publications resulting from their research; though it is often not clear to them precisely how museums make use of such information. Researchers would welcome the opportunity to contribute more. If records were made available online, it would be easier for them to do so, especially if Web 2.0 technologies were incorporated enabling them to add to or amend existing records. Improving the accuracy and quality of museum records and documentation is a huge and never-ending task, but also a duty for museums. Putting existing records online is a first and essential step which would enable the research community to assist museums in fulfilling that mission.

4. Museums' perspectives

This section looks at the development of finding aids from a museum perspective and examines some of the issues that have so far prevented museums from making databases more widely available online to researchers. It then looks at some of the opportunities now offered by advances in technology and related developments, and examines their cultural implications.

4.1. Online finding aids and discovery services

A number of online finding aids and discovery services currently available are of potential interest and value to researchers:

- local finding aids to the collections of individual museums
- regional finding-aids which include museums within a specific area or region
- finding aids covering museums across the UK, and
- subject-specific finding aids which include the collections of several museums.

The discovery services and finding aids described in this report illustrate a number of different approaches to the provision of online information. Although some were developed with researchers in mind, there is very little evidence, as noted in section 4.3, of researchers using or even being aware of them.

It is important to stress that the quality and coverage of the regional, national, and subject-specific services we describe below all depend on the quality, as well as the availability, of the information in individual museums' databases. Hence we start with what is being done by individual museums, particularly in terms of making their records and other information available online.



Sue ware jar From Japan, Kofun period, 6th century AD
© The Trustees of the British Museum

Museum websites

Museums today have to meet the needs of a diverse range of audiences, of which researchers form only one part and they lay particular stress on making their collections accessible to a broad public. Most museums have some form of online presence, though this is often restricted to contact information with perhaps a limited range of collection-level descriptions focusing on star items. Such pages are typically presented and written in accessible, non-specialist language. They are admirable in themselves, but they are unlikely to be useful to researchers.

The question of how far discovery services aimed at the general enquirer can meet the needs of researchers, is raised by Hedley Swain, Head of Museums Policy at the MLA:

CASE STUDY

The Fitzwilliam Museum



The *Fitzwilliam Museum* database at the University of Cambridge provides an online service linked directly to the museum's content management system, giving detailed descriptions of objects, with specialised searching designed specifically for the research community. It complements other resources on the museum's website, which shows highlights of the collection and is intended for an audience with a more general level of interest.

The online version is described as the 'public window' into the museum's central database, created with funding from the MLA's Designation Challenge Fund. About 30% of the collection is so far represented on the central database, and the online catalogue is regularly updated. Of 152,000 records available online, about 43% have digital images attached. A variety of search methods are possible, and for each object there is a record, including such information as accession number, dimensions, inscriptions/marks, provenance and related documentation. Detailed searches are available for researchers interested in specific collections such as *coins and medals, or prints*.

.....
 Early Anglo-Saxon coin from the De Wit collection
 © The Fitzwilliam Museum, Cambridge

the size and nature of unregistered objects. Original register entries, including drawings, are being included. The database includes full descriptions and is designed to replicate the existing catalogue record. The public database builds on the internal one, but omits sensitive information, such as exact location and conservation history. Users are asked to correct errors or add information using an email link.

This new database (accessible through the *research tab* on the British Museum website) is separate from the *Explore* part of their website which includes records for 7,500 objects in the collection and has been designed for the general public, with text written by website editors, whereas descriptions for the collections database are written by the curators.

.....
 Helmet from the ship-burial at Sutton Hoo (Replica, front view)
 Anglo-Saxon, early 7th century AD © The Trustees of the British Museum

CASE STUDY

Buckinghamshire County Council

Buckinghamshire County Council's *More to explore@museum* is an example of how a regional museum is seeking to raise awareness of its collections by providing details of objects currently in store as well as those on display. The database is derived from the MODES content management



system, though with a limited number of fields. It is searchable by theme (for example, archaeology, rocks and fossils or social history), by parish or by keyword. For each object listed there is an image, accession number and brief description. While the number of objects is limited, the service illustrates how it is possible to provide object-level descriptions derived from an in-house database and how a small local museum can go beyond describing only its star items.

.....
 A mid-19th century poke bonnet with green silk covering, wired with silk ribbons. It belonged to the donor's mother or her family, from Ellesborough, Bucks © Buckinghamshire County Museum Collections

In other cases, online catalogues have been produced as an 'add-on' to a major bid for funding. Results may not always be satisfactory where this has not been the main focus of the funding. The Cotswold District Council's Corinium Museum Collections Online catalogue developed with Heritage Lottery funding was praised by one of the archaeology researchers interviewed, though neither it, nor the similar Wrexham Museum Catalogue, was easy to find through the respective council's websites. A researcher would have to know they were there and be fairly persistent in searching in order to find them.

These examples illustrate the type of work now underway to develop and enhance museum catalogues and to put them online, and the magnitude of the task. Most can be described as 'work in progress' since they do not yet contain records of all the museum's holdings. They provide levels of detail that meet many of the needs of researchers but often they do not contain images and they are not always easily accessible through the museum's home page.

Whatever the merits of these initiatives by individual museums, however, they do not as yet meet one of the key requirements highlighted by researchers: the integration of catalogues and the availability of cross-searching, at regional, national, or subject levels. Approaches to such integration are described below.

Regional online finding aids and discovery services

A good example of an attempt to integrate finding aids to collections across a specific region is Manchester Museums Unwrapped, and there are other, less well-developed, examples such as the Berkshire Collections Gateway.

CASE STUDY Berkshire Collections Gateway

The Collections Gateway brings together information about museums and libraries in Berkshire, including the Reading University Museums. As its name implies, it provides collection-level descriptions, though the search facility may link to item-level descriptions where these are available. A particular feature is the inclusion of descriptions of recent research projects undertaken using the relevant museum collections. The level of detail provided by different institutions varies, and the service depends on individual museums keeping their pages up to date.

The inclusion of Manchester Museums Unwrapped in the People's Network Discover service shows how such regional initiatives can be promoted more widely at national level. It also demonstrates the benefits of a planned approach, with all museums involved making an early decision to purchase the same software. The ability to cross-search the collections of five museums in one city, is clearly of benefit to researchers, as well as to other users.

Despite the success of these two projects, regional approaches are likely to remain patchy. They cannot in themselves provide a solution to the current wider lack of online databases and discovery services, or give researchers the ability to cross-search with confidence that they will discover more than a restricted sample of the objects that may be relevant to their research.

National and UK-wide finding aids

There have been various initiatives in recent years to develop finding aids at national and UK levels that may have potential value for researchers.

CASE STUDY Manchester Museums Unwrapped

Manchester Museums Unwrapped is an initiative developed by the five Manchester museums with Designated status, assisted by funding from the Designation Challenge Fund. All museums use the same software (KE Emu) and the database provides object-level descriptions, many with images, and allows searching of individual museums, cross-searching, and search by pre-selected themes.

Cornucopia

Cornucopia provides collection-level descriptions for some 6,000 collections held in almost 2,000 museums, libraries and archives in the UK. It was first developed for the MLA from a pilot service in 1998, and institutions are now responsible in most instances for adding to or amending their own records. Cornucopia can be searched by subject or institution, with the facility to add Google search, and it also has an OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting) interface to allow data to be harvested by other systems (Turner, 2004).

Given its history and early entry into a rapidly-changing technological world, it is not surprising to find Cornucopia now criticised by one person as a 'good idea done badly', with information incomplete and not kept up to date. A survey conducted in the East of England in 2006 (Taylor and Sansom, 2006) found important collections omitted, descriptions of 'star items' variable, and contact information not always accurate.

MICHAEL

MICHAEL (Multilingual Inventory of Cultural Heritage in Europe) currently allows users to search descriptions of digital resources held in France, Italy and the UK. Information from a further 11 European countries is to be included through the new MICHAEL Plus project, with funding from the European Commission's eTen programme. MICHAEL contains descriptions of digital collections searchable by subject or place, with a link to the collection's own website. There is a facility to browse by 'audience', including 'academic researcher' though this currently returns no entries for the UK.

The UK version, MICHAEL-UK follows a similar format to Cornucopia and can be browsed by a wide range of general subject headings or by keyword search. While there is some overlap with Cornucopia, the concentration on digital collections

Autumn, Embroidered panel, 4th century. This work is part of The Whitworth Art Gallery's collection and was part of an exhibition in late 2006, called 'Clothing Culture: Dress in Egypt in the First Millennium AD'. © Whitworth Art Gallery



means that MICHAEL provides a searchable inventory of digital resources produced by museums and other heritage services aimed at a general audience.

24 Hour Museum

The 24 Hour Museum (run by Culture 24) provides 'news, listings and features' from over 3,000 museums, galleries and heritage sites. In addition to giving up to date news of exhibitions and other events, it provides basic contact information for each museum, and a facility to search collections by subject. It is an independent charity, with funding from the MLA.

The 24 Hour Museum has proved the most popular of the three MLA-supported finding aids, with over 850,000 visits a month. It is considered to have the best interface for contributors, making the addition of news items or changes to contact details easy. As shown in section 3.3 above, researchers make little use of this type of collection-level description service, other than for basic contact information. Such services do not provide the sort of detailed information that researchers seek prior to a visit to a museum, although they may constitute a basis on which to provide such information in the future.

People's Network Discover

Unlike the services described above, People's Network Discover provides item-level descriptions, linking directly to the description provided in the museum's own website, rather than requiring a separate search as in Cornucopia. As well as picking up collection-level descriptions from Cornucopia and MICHAEL, its detailed search facility currently covers item-level descriptions from some 20 sources, including the Fitzwilliam Museum, Manchester City Galleries, and various project and heritage sites. Its value is limited at present by the small number of museums represented.

The service is not actively promoted, although the MLA, The Collections Trust and Culture 24 are working together to build a more integrated and comprehensive service for the future. With these plans, People's Network Discover has the potential to provide the type of item-level description of interest to researchers. Its future success depends on more museums making their records available online in a form that can be harvested by this and other services.

Subject specific online finding aids and discovery services

We identified a number of subject-specific finding aids. The ones discussed here represent a small selection of the subject databases now being developed or at the planning stage. Each depends on the enterprise and interests of the group of researchers who developed the database, and they demonstrate the value of collaborative working. They have been developed in response to specific needs felt by researchers, and they generally include full descriptive information and often also digital images. But usage and usability outside the particular group that developed them has typically not been a primary objective, as one researcher directly involved pointed out:

While creating it there was no time to think about what it is and what it may require. It might need more interpretation.

With the exception of the Portable Antiquities Scheme, which is well established and known among archaeology researchers, other databases discussed here are either at an early stage of development or, as with FENSCORE, currently undergoing significant change. It was therefore not possible within the study to investigate how far such databases are being used by researchers. Some are not well-publicised and are difficult to find. There is potential to market them to a wider research community, not least by ensuring that they can be harvested through a service such as People's Network Discover.

It is also important to note that since most of these databases were created through project funding, future development will depend on their ability to identify other means to sustain them when project funding comes to an end. The Domestic Interiors Database, for example, was created for researchers involved in a specific research programme; any continuing role will depend on securing funding to make the database more visible and usable.



Portrait of Thomas Bewick, Sir John Guthrie, Laing Art Gallery
© Tyne & Wear Museums

those who were early in the field may become hampered by out-of-date technology, making the service less well-used and also the difficulties in securing funds for systems to be updated. A new project, the Biodiversity Collections Index now aims to produce a single annotated index of all research collections of biodiversity materials and it is hoped that, as part of this process, it will bring the FENSCORE data up-to-date.

International scope

Many UK-based researchers make use of overseas museums and collections for their research. A number of other countries have developed national finding aids, and some examples are given in Appendix 2. Europeana is a two-year EU-funded project to enable a European digital library, museum and archive that began in July 2007. It will have a website that gives users access to objects and is due to be launched in November 2008. As with any online resource, it depends on the availability of good records from the participating museums, galleries and libraries.

4.2. Barriers to putting information online

Most museums now have in-house electronic databases, mainly using proprietary museum software such as MODES based on SPECTRUM standards (see section 4.3). There are, however, a number of barriers to putting online the records that museums hold in their in-house systems.

Backlogs

The *MLA Accreditation Standard* requires all museums with accredited status to have a written documentation plan, including details of how they will deal with any cataloguing backlog. A survey of Scottish Museums (Bhandari, 2007) reported that 81% of respondents had a programme to deal with backlogs, with the majority aiming to complete this within four years. Many of the museum staff we interviewed were unsure of the extent of their backlogs, pointing to the large amount of material, especially from archaeological excavations, simply stored in boxes. Some echoed the Scottish estimate that it would take four to five years to deal with their backlogs and get all their records onto a database, though they stressed this would depend on funding and/or the availability of volunteers. Others, faced with outdated inventories and boxes of uncatalogued stock, were more pessimistic, suggesting 10-15 and, in one case, 30 years to complete the task.

CASE STUDY FENSCORE

FENSCORE is a searchable database of records of natural science collections held in the UK, initiated by the Federation for Natural Science Collections Research in 1986. As a basic web database, it has had little attention in recent years and retrieval systems are poor. An early entrant to the field, it is now in need of updating and has not been much promoted. Data from FENSCORE was used for the EU-funded BioCASE project (Biological Collection Access Service) that allows cross searching of 'hundreds of collection databases, ranging from fossil collections to DNA bands' and is also available in the Global Biodiversity Information Facility. The new EU-funded Synthesys project is also developing a GeoCASE portal which allows searching either fossils or minerals and rocks.

Both museum staff and researchers also point to ways in which backlogs may be exacerbated by the demands of new collections. Thus there are difficulties for local museums in providing adequate storage and curation when major archaeological sites are excavated in their vicinity. In earth sciences, the practice of individuals or departments building up private collections causes problems when these are later donated to museums:

With geology, people often bulk collect so they have lots of material which a museum will accept. So we might take a large collection, which is difficult to catalogue.

In social history, there is a challenge for museums in how they should plan to collect and catalogue everyday objects that have not traditionally been part of their collections.

These backlogs and related problems are a major source of concern to museum staff, who also point to a lack of expertise that means they cannot transfer data to their own systems, and so may need to spend time repeating work that has already been done. Crucially, they see dealing with their backlogs as a necessary precursor of making catalogues available online. Until the catalogue is complete, many museum staff seem unwilling to make it public.

Accuracy of catalogue records

In addition to un-catalogued or only partially-catalogued material, the nature and quality of cataloguing information varies considerably. Handwritten, printed or card catalogues may contain information that is outdated, misleading, incomplete or simply wrong. Classification systems may cause particular problems:

When using an accession register or card catalogue it depends on how the object has been classified. Different terms may be used in different periods/areas of archaeology.

You cannot do 21st century input with 19th century classification.

Some museum staff are concerned about perpetuating inaccuracies and inadequate detail in online catalogues, and the need to find appropriate terminology:

The information itself may be wrong, the handwriting bad. If all this is copied wrongly it gets perpetuated.



Botswana Agate. This fine cabinet specimen of Botswana agate shows sharply contracting bands as well as inclusions of green magnesians chamosite. This specimen is owned by Roger Pabian © The Natural History Museum, London

.....
With databases, there is a problem of transcription from paper. How consistent are the terms used? It takes time to decide on the fields to use.

Difficulties also arise with variant spellings of place names, inconsistent use of Latin and common names, and the need to consider how researchers might search for material, by context, group or theme, collector, as well as by object name:

The old card catalogue approach tended to say 'this is all ivory' but now there is more interest in the period or the site than the material. Scholarship has changed.

Establishing a database demands initial work to ensure that the data will include the kinds of search terms that researchers are likely to use. The use of standard terms should help here, but we noted that museums also tend to develop their own thesauri, which is probably inefficient, as well as producing difficulties for users in cross-searching when databases are put online (the Collections Trust provides a list of recommended thesauri).

All these issues and difficulties are significant in the light of the reluctance of museum staff to make records available more widely if they consider them to be incomplete or inaccurate:

...because of the way the system was done – different people and different times – the consistency of the data is

not what you would expect from an online resource and latterly the information that went online was minimal.

This may lead to a more general scepticism about the value of putting catalogues online, as noted in a Museums Association inquiry (*Collections for the future, 2005*).

Beyond the museum, the Internet offers remote access to many collections and, crucially, to a wealth of information about them. However, the inquiry shows that some museum staff are sceptical about the benefits of investing in digitisation, believing that online access to collections offers a relatively poor-quality experience for a relatively high cost. But this is to underestimate its future potential.

Lack of supply and of demand reinforce each other unhelpfully here: since there are few databases available, researchers do not use them very much; and curators feel able to wait until the records are perfect before making them available online.

Level of cataloguing detail

Backlogs and the difficulties in transferring old records to online databases give rise to questions as to the level of detail required in catalogue records, and in particular as to whether and in what circumstances collection-level or item-level descriptions are most appropriate. The *Collections for the future* report (Museums Association, 2005) suggests that subject-based finding aids should adopt the 'more pragmatic approach' of collection-level, rather than item-level, descriptions.

The Scottish Museums Council (2006) has similarly looked at the collection-level descriptors as the basis for a single portal for Scotland's Distributed National Collections. They suggest that this is actually a more useful approach, as well as saving time and effort:

Museums are still discovering whether the scope of the collections information they offer online is in accordance with what users want, and further evaluation is required of how easily users are able to locate and access it. For example, whilst detailed object-level records are essential for those working in museums, a simple overview at collection level might be more accessible, and more useful, to the general enquirer.

Glasgow Museums has adopted a pragmatic way of cataloguing a large collection within a realistic timeframe. They estimated

that it would take 20 years to re-enter every record, and so adopted a different approach with their Collections Navigator project. This uses collection-level descriptions which start at a very high level and are then broken down through four levels into collections of between ten and a hundred objects. The Collections Navigator website will include the facility to contact curators, to book an appointment to view items, and to link to associated documents. The Natural History Museum's Collections Navigator uses a similar approach, providing a 'half-way house' between basic collection-level descriptions provided by services such as Cornucopia and more detailed item-level descriptions which, however desirable, are much more time-consuming to produce.

For some kinds of material, indeed, such as collections of sherds or flints, producing item-level descriptions is both unrealistic and inappropriate:

If you have a bottle of flies do you want to count each of them?

If you started at 'fossil 1', you would just go mad and it would be a pointless exercise.

The approach of 'bulk-cataloguing' is well-understood and accepted by both curators and researchers as a means of making such material discoverable and accessible.

For other kinds of material, however, such as paintings, item-level description is essential. The problem for researchers is that even within a single museum the level of cataloguing may vary considerably, and seemingly haphazardly. It is not uncommon for museums to have some parts of their collections catalogued in great detail and others not at all. The level often seems to depend on the expertise of a particular curator, past or present, or on the work of an external researcher. It may also depend on project funding, as with the planned Birmingham Museums and Art Gallery's Pre-Raphaelite resource site which has received funding from JISC for specialist input into the digitising of the Pre-Raphaelite collection.

The level of detail to be included in catalogues, either in the short or the long term, is a key strategic issue for museums to consider, and one on which they would often benefit from the advice of researchers. Bulk cataloguing and collection-level descriptions may be adequate in some cases, and grouping items into categories may be a good short-term approach to dealing with cataloguing backlogs and getting catalogues online more quickly. Museums also need to remember that once descriptions are available online, researchers will be able to add more information themselves or, where necessary, to amend the records provided.

4.3. Technological challenges and opportunities

This section looks at standards and guidance available to museums and at technological developments, showing the challenges and opportunities they present for the future.

Standards and guidance

The MLA Museum Accreditation Scheme

The MLA's Museum Accreditation Scheme carries a requirement for the maintenance of "the primary documentation procedures as defined by SPECTRUM", including:

Provision of appropriate indexing: the museum must maintain appropriate indexes or equivalent information retrieval facilities. The accessions register provides a method of retrieving information about items in the collection by their identity number. There must be at least one other method of retrieving information, such as by location, donor or subject classification, according to the needs of museum users.

The Collections Trust and SPECTRUM

The Collections Trust provides guidance to museums to help them achieve national standards, in two interlinked strands, Collections Link and SPECTRUM. Collections Link is a national advisory service for collections management, covering 16 subject areas. In archaeology, for example, it offers guidelines on 'bulk accessioning', while social history has a section on terminology control using the *Social History and Industrial Classification*. The website also includes several case studies of how museums have approached documentation backlogs.

SPECTRUM is recognised both nationally and internationally as the standard for museum documentation. It is freely available for download from the SPECTRUM website, and it is incorporated into most of the major museum content management systems such as MODES, KE Software, CALM, etc.

As discussed in section 4.2, many museums staff claim that sensitive information in databases mean that they cannot be made available online. All the ten systems that are SPECTRUM compliant, however, offer a web module to allow public access while suppressing certain fields. Most of the online databases featured in this report make use of this facility: the Fitzwilliam Museum through Adlib, the Manchester Museums group through KE Emu, and the Buckinghamshire County Council Museum,

operating on a smaller scale, through MODES. Indeed, the MODES Users Association, which offers a web hosting service for those museums unable to host an online service themselves, provides specific advice about the suppression of confidential information.

The survey of Scottish museums mentioned above (Bhandari, 2007) found that 68% of those with in-house systems were SPECTRUM-compliant. It appears therefore that for comparatively modest costs, most of those museums that already have in-house content management systems could make these available online. One small museum thought the costs were reasonable – provided, of course, that the collection itself was comparatively small:

I'd like to put the archaeological collection online – there are 1800 objects. It could be put up by the people who do MODES, the charge is £1 a record. But the palaeontology collection would be too big.

In fact, MODES estimate that they could put a small database online for a budget of around £1500.

There is currently no universally accepted standard for resource discovery of museum objects. Some museums use *Categories for the Description of Works of Art* (CWDA), a US standard for paintings, while others use *Cataloguing Cultural Objects* (CCO). The Collections Trust is currently aiming to build into SPECTRUM standards for resource discovery, such as the Dublin Core-based schema implemented in the People's Network Discover service. In practice, if museums demand it, systems suppliers will be forced to offer these features.

Adding contextual and related information to the record

Although getting the in-house database online in its current form must be seen as a priority, adding to the record contextual information about objects and their history would be highly desirable from the perspective of researchers. Reports such as *Revisiting Collections: Revealing Significance* (MLA, 2005) and *Collections for the future* (Museums Association, 2005) have highlighted the need to include as full a set as possible of descriptive and contextual material about objects and collections as a key means of making them more accessible and understandable to a wide variety of audiences:

The potential of digitisation is not limited to collections themselves. In a digital environment, the ideas and

research around collections are just as valuable a resource. Museums must continue to digitise their collections and the information that accompanies them, as building blocks.

Some online databases such as the British Museum's and the NICE Paintings database already provide this kind of information, drawing on the expertise of specialist curators and researchers, though neither currently provides direct links to the references cited. But for the most part such information, if recorded at all, is kept separately, and may not be noted in in-house databases, which means that the relationship between the record and the object is imperfect.

If the full potential of online catalogues is to be exploited, it is clear that having a facility to add contextual information becomes a key system requirement.

If the full potential of online catalogues is to be exploited, it is clear that a facility to provide access to contextual information becomes a key system requirement. The ability to link to online versions of reports and articles is now becoming accepted practice in library catalogues through the use of link resolvers, and there appears to be no reason why museums should not adopt a similar approach.

Exposure to web search engines

Several researchers told us that they would start research in a new area with a search on Google, and museum staff as well as researchers believe that Google, Yahoo and other search engines pick up entries from museums' online databases.

This is not in fact the case, and few museum objects from the UK can be located through a general web search, with some exceptions such as those recorded in the Portable Antiquities Scheme. Nor does Google Images bring up images of many museum objects from the UK, though there appears to be better coverage of US museums. In a recent conference paper, Ellis and Kelly (2007) challenge museums to adopt new technology:

Take Google Images. Here is a tool which sets out specifically to side-step on-site search engines and to provide a much more powerful user-focused interface. Why search one museum site for information on George Stephenson when you can search the entire web?



Sioux Indian amulet in the form of a turtle © Wellcome Library, London

The point applies more broadly to textual records as well as to images, and it is clearly important both for the research community and for other users that museums should take active steps to ensure that their records are harvested by Google and other search engines.

Web 2.0 and the Semantic Web

The development of Web 2.0 technologies has the potential not only to improve access to museum collections, but also to enhance multidisciplinary and cross-professional working between museums and researchers. The collaborative, social nature of Web 2.0 may prove a significant bonus in itself, making it easier for researchers from different institutions and locations to work together in developing knowledge about collections.

At present there are relatively few examples of museum websites and catalogues which make use of Web 2.0 or Semantic Web approaches. The East Lothian Museums blog, although not directly aimed at researchers, provides an example of how an interactive website can work, encouraging users to add content and to correct any errors in the record.

CASE STUDY

Behind the Scenes

East Lothian Museums have created a blog called *Behind the scenes* and a number of Flickr photo albums. This allows users to assign their own tags, add comments, and link to related items both within the museum collection and globally. This approach has resulted in new information about museum objects being gathered. The museum is currently working on a new database using open source software. The plan is to allow visitors to comment on objects and to add any extra information. This information will then be searchable along with the main catalogue record and, if appropriate, added to that record.

The UK Museums and the Semantic Web, one of the research workshops for museums and galleries funded by AHRC, shows the extent of interest in these developments among museum professionals, and showcases interesting overseas developments such as CultureSampo, Finnish culture on the semantic web, and the use of tagging and user-generated keywords at the Powerhouse Museum in Australia.

There is also the potential to use mash-ups to enhance catalogues, an obvious example being in archaeology to link find locations to Google Maps. The Portable Antiquities Scheme is also a good example of the use of RSS feeds, either to update subscribers about new items of interest, or to embed feeds from other sites in order to provide local news or national developments in a particular subject area.

A semantic approach will provide a route for the addition of richer content, generated by museum staff and by researchers or others who will have access to a section of the website where comments and record amendments can be added. This will bring museum online services in line with current developments in social networking sites.

Harvesting of metadata

Harvesting of metadata is key to enabling researchers and other users to search across a number of museum databases, and there are a number of examples of services which facilitate or make use of such harvesting:

- People's Network Discover Service uses a variety of approaches including the Open Archives Initiative Protocol

for Metadata Harvesting (OAI-PMH) to search across a range of databases.

- The ARTstor digital library includes some 550,000 images contributed by a wide range of institutions in the US and in other countries, including the UK. The ARTstor XML Gateway allows meta-searching, and is available through federated search products familiar in libraries, such as Serials Solutions and Metalib
- The Online Computer Library Centre (OCLC) is beta-testing a museum software system, OAICatMuseum, which will allow museums to share digital images using OAI-PMH
- Europeana, the European Digital Library, will use the OAI-PMH protocol to harvest metadata from a wide variety of museum, library and archives databases from across Europe, including People's Network Discover.

Developments such as these could bring significant benefits to researchers and other users. They emphasise once more the need for museums to put records online so that they are available for harvesting. They also illustrate the need for common standards, so that sharing and harvesting of metadata is not inhibited by large numbers of customised and incompatible tools and formats.

Current developments in finding aids and discovery services

Culture 24

The MLA, the Collections Trust and Culture 24 (the organisation that manages the 24 Hour Museum) are working together to build a more integrated approach to the management of resource discovery tools. They are seeking to develop through an integrated architecture project (IAP) a more joined-up approach to MLA funded services and to avoid duplication by providing a unified framework for the future which will:

- provide access to high-quality content and up-to-date information about, and from, UK museums, galleries, archives, libraries and heritage sites, and
- reduce duplication in expenditure on web infrastructure, giving the sector easy-to-use and sustainable publishing tools.

This IAP service will bring together the data held in Cornucopia, MICHAEL, the People's Network Discover service and the 24 Hour Museum and also provide a platform for the work of Subject Specialist Networks (see Section 4.4). It will also host the developments planned for the Peoples Network Discover

CASE STUDY

Wellcome Library

The Wellcome Library includes a collection of 2.5 million objects, mainly prints and drawings, but also three-dimensional objects. Other objects in the Henry Wellcome collection are on loan to the Science Museum. The library is developing a new image-driven web catalogue called Uncover which will use a touch screen. The text will be written by experts then re-written in plain English. The aim is to include 5,000 objects on this database, with three different levels of display: exhibitions and gallery information (for general public); full record (for academic use), and full curatorial record giving provenance and history (for researchers' or curators' use). The database has been developed with help from researchers on questions of interpretation, using community tagging. It is hoped later to allow researchers to key information into the database directly. The software used for objects already provides links with the library OPAC and this will continue with Uncover. The system will 'tag cloud' words in different font sizes, as a form of hidden metadata for different levels of description.

we may have material relating to ancient Egypt in archive collections, which would usefully be exposed alongside the catalogue of objects and books about ancient Egypt.

The survey showed that a number of university libraries are interested in including museum objects in their catalogues, and also the potential of library systems such as Innovative and Talis.

The survey thus showed that a number of university libraries are interested in including museum objects in their catalogues, and also the potential of library systems to accommodate this development. The Uncover developments at the Wellcome Library illustrate how new services can incorporate Web 2.0 and Semantic Web features. There is no reason why similar initiatives could not be developed within county library services and museums. The opportunity to be directed to different types of resource from a single point of entry is attractive both in

simplifying search procedures and in directing researchers to resources of which they might otherwise be unaware.

Many university libraries are also closely involved in the development of institutional repositories to hold and provide access to, among other material, the research outputs of researchers in their institution. Such repositories have concentrated so far on text-based output, but data relating to objects could also be included. One current JISC-funded project called Kultur is aiming to create a multimedia repository in the creative arts. This will provide an opportunity for researchers to deposit multimedia outputs in a repository, where they will be accessible to other researchers and students in the same way as text output. With many different kinds of outputs, including archaeological excavation reports, providing links to online databases such as ArchSearch are particularly important.

4.4. Cultural change and collaboration

Developments in technology and standards are providing new opportunities to improve finding aids. Both researchers and museum staff believe that significant improvements are already achievable. They often see the principal barriers as cultural:

It's not technology that's the issue, its culture and priority. It will happen but it's hard to say when.

The need to encourage collaboration (not least with researchers) and innovation in museums has long been recognised, for example in the *Collections for the future* report (Museums Association, 2005) and more recently in the McMaster report, *Supporting excellence in the arts* (2008):

It makes sense for museums to pool their resources by working across institutional boundaries, to begin to address the shortfall of expertise and to find ways of making better use of under-exploited collections. Groups of museums working together would be well placed to draw in external expertise, from higher education, industry and enthusiasts' groups.

Subject Specialist Networks were set up by the MLA as part of the Renaissance in the Regions initiative as a means for sharing expertise and knowledge across the whole museum sector. Renaissance project funding is available on an annual basis and in 2007-2008, 14 networks received funds for projects that

often include the development of online discovery services. The Collections Link webpage currently lists 42 Subject Specialist Networks, and provides much practical advice arranged by subject. The networks include:

- Association of Curators for Collections from Egypt and Sudan
The Accessing Virtual Egypt database (see section 4.1) provides a good example of a project which brings together information on collections held in a range of large and small museums and
- Social History Curators Group, which is responsible for the FirstBASE project, a further example of a project resulting from cooperation among museum curators.

Other networks provide a forum for discussion and action in other specialist areas, including the Urban Social History Contemporary Collecting Network, the Rural Museums Network and various networks relevant to the history of art.

These networks provide an opportunity for sharing ideas and also the potential for developing joint projects, including the creation of searchable databases across their subject areas. They also have the potential, as yet seemingly untapped, to provide a forum through which researchers could work more closely with museums and contribute their specialist expertise. Most researchers look to their own specialist networks to keep them informed of new developments. Links with Subject Specialist Networks would give a route for researchers to be informed of, and even to engage actively with, developments in their specialist areas.

4.5. Funding issues

As noted earlier (Section 4.2), securing the resources to develop catalogues and other finding aids presents problems for almost all museums. Such work must find its place among many competing priorities. This section looks at current sources of funding as well as the funding constraints.

Many different sources of funding have been used to develop online finding aids. Several museums have used project funding to do cataloguing work that would not otherwise have been feasible. Most of this funding has been for making collections available online, rather than the creation of in-house databases, though such databases are of course an essential prerequisite for an effective online discovery service:

- **Heritage Lottery Fund (HLF).** The HLF has contributed much to the development of museums over recent years,



Penny Black stamp press. This press was presented to the British Library by Perkins Bacon Limited in 1963 © The British Library

- much of it to fund buildings or new facilities; but some projects included development of online resources.
- **Designation Challenge Fund.** Since 2002, the MLA has invested £13 million to support Designated collections. A number of projects funded at a level of around £100,000 each have included the development of online databases, such as Manchester Unwrapped (section 4.1).
- **Renaissance in the Regions.** Through the MLA's Renaissance programme, grants have been made to support the regeneration of regional museums, including the development of Subject Specialist Networks. Advice and support is also given to 'non-Hub' museums through the Museum Development Fund.
- **AHRC.** In addition to its core funding to meet the recurrent costs of university museums and galleries, the AHRC during 2002-2005 funded 58 individual projects, many of which were for the digitisation of collections, such as the funding provided to the Garstang Museum at Liverpool University and to the

Institute of Archaeology at University College London. The AHRC also runs the Collaborative Doctoral scheme through which research students have contributed to the development of online finding aids.

- **JISC.** JISC funds IT-related projects in the higher education sector. A number of university museums and collections have benefited from involvement in projects which were part of the Distributed National Electronic Resource or the more recent FAIR programme.

Although researchers are clearly one of the groups to benefit from the funding provided by these various bodies, with the exception of the AHRC, relatively little of the work has been undertaken with the needs of researchers specifically in mind. HLF and MLA-funded projects in particular tend to focus on making collections more readily-accessible by the whole community.

Success in securing project funding depends on museums developing projects that meet the policy aims of funders. Museums vary in their capacity to develop projects that meet those aims and smaller museums in particular may lack the time or expertise to develop such bids. Production of an online catalogue in itself is not generally sufficient to attract external funding. Many of those to whom we spoke believe that project funding tends to lead to a concentration of funding in a small number of museums, particularly Renaissance Hubs, or those with Designated status:

Being Designated opens up avenues of funding which are not there if you are not.

AHRC and JISC grants similarly go generally only to university museums, while Renaissance in the Regions funding is not generally available to non-Hub museums. Smaller museums are therefore at a disadvantage, both in having fewer funding opportunities and also in having less time and expertise to put together a bid to the HLF or other funders. Smaller museums may also lack the resources to ensure that initiatives funded through project funding can be sustained once the funding comes to an end.

The major projects undertaken by the large and national museums have thus created a perception that it is not possible for smaller museums to get their collections online at a cost they can afford. Many of our interviewees pointed to the danger that this may lead to a skewing of the coverage of UK-wide databases.

Despite all the difficulties, it is clear that project funding plays a critical role in the development of online databases, and that

without it the prospects for further development would be much worse for all museums, particularly those beyond the major national institutions. It is not surprising that for some museums an online catalogue of any sort remains an impossible dream. But it is important to stress that many smaller museums have fully catalogued their collections, and that those catalogues – particularly those created using MODES software – could be made available online at a modest cost: transferring the data held in-house content management systems to online databases is not as complicated or costly as some museum staff suppose. Examples such as Buckinghamshire County Council (see section 4.1) or Wiltshire Heritage Museums show what can be achieved with relatively little funding.

4.6. Key findings

Online finding aids: The current situation

The online finding aids currently available range from those provided by individual museums to those at regional and national level, some of which focus on a specific subject. A few have been developed with the needs of researchers specifically in mind, but little evidence has been gathered yet as to how they are actually being used.

National, UK-wide and subject-based services are potentially of huge value to researchers. The UK-wide services currently available do not as yet provide the detailed information that researchers need, although Peoples Network Discover (now being developed under the aegis of Culture 24) has great potential. Some of the subject-based services currently being developed by enthusiasts, often with project funding, also have considerable potential value for researchers. But with a few exceptions, such as the Portable Antiquities Scheme, it is not yet clear that they will be able to build a sustainable service of value beyond their currently small user base.

Moreover, the quality, coverage and value of any such services depends critically upon the willingness and ability of individual museums to make their records available online, and on the quality of those records. While most museums have moved from paper or card to electronic collection management systems, few have yet put their records online. It is encouraging that some museums are now starting to do so, although the full potential of providing access to the records will be realised when they are available not just through individual museum websites, but through broader national and subject-based services.

5. Conclusions and recommendations

Object-based studies remain an important aspect of research in many disciplines and subject areas. Researchers in these areas value museum and other collections and want the records relating to them to be put online as soon as possible. The relationships between researchers and the curators of collections could and should be close and mutually beneficial. But the finding aids and discovery services provided for museum and other collections have not kept pace with those provided for textual material held in libraries and archives. The idea of a library without an online catalogue, and without a facility to cross search other library catalogues would now be unthinkable to any researcher but the lack of these services is still commonplace among museums.

Researchers value museum and other collections and want the records relating to them to be put online as soon as possible.

Researchers adopt a number of strategies to find and locate objects relevant to their research, and they rely very heavily on the specialist expertise of curators as well as on references they find in the scholarly literature. However, there is huge potential to exploit the opportunities presented by new technologies to develop finding aids and discovery services that will meet the needs of researchers, and also enable them to contribute more readily and actively to the further development of such services, to the benefit of the wide range of museum users.

In seeking to realise this potential, museums and other collections have to overcome a number of barriers. Most notable is the reluctance of curators to make their records available online before they have eliminated cataloguing backlogs, and ensured that their current records are accurate and complete. We make a number of recommendations below as to how to overcome these barriers and allow information to be made available to the research community and others, to enable them to find and locate the collections and objects that are crucial to their research.



Sapphire turban button. A 'rose-cut' faceted deep-blue sapphire mounted in a button of quartz, inlaid with gold, rubies & emeralds. No 198 in the collection of Sir Hans Sloane © The Natural History Museum, London

Recommendations

1. Getting catalogue records online quickly

All museums and similar collections should make the research data in their content management systems available online as soon as possible, without waiting until backlogs are cleared or records improved to levels of perceived 'perfection'.

Most museums now have content management systems employing software from one of the system suppliers based on the SPECTRUM standard, but few beyond the large national and university museums have made their records available online with any form of item-level descriptions. They are reluctant to do so because of concerns about incompleteness or inaccuracy in the records, and worries over the confidential information they may contain. The concerns as to accuracy and completeness are, we believe, misplaced, and represent a misconceived and probably unattainable ideal. Moreover, curators' concerns about

the publication of confidential data are also unfounded, since museum system suppliers can ensure that fields containing sensitive data do not appear in online versions.

Whatever the inadequacies, real or perceived, of current catalogue records, we believe that making the data in content management systems available online is an essential first step to improving discovery services for the benefit of researchers and, indeed, other users.

To fulfil this recommendation, and to ensure that records are readily available and findable on relevant websites, museums and other collections may need help and guidance from MLA, the Museums Association, and related organisations. We suggest that:

- MLA should consider asking museums for their plans to make databases available online as part of the Documentation Plan required for accreditation
- Collections Trust should encourage all museums with in-house content management systems to make the data available online, even if they are not yet complete. They should also demonstrate how this can be achieved technically, with fields containing confidential information suppressed. Museums should be provided with suitable advice and access to technical expertise where required
- Collections Trust should develop a standard template for museums to use to explain the coverage of their catalogues, and the nature and level of detail in the records they contain, and
- Collections Trust and Collections Link should identify and promote examples of good practice in the siting of databases within museum websites.

2. Clear and open policies on access

Museums and other collections should develop and publish on their websites a 'researchers' charter' including clear policies on the arrangements for visits by researchers, covering issues such as the support and facilities available for browsing collections, handling objects, sampling and testing, and loans.

For most researchers, the end point of a search for an object is engagement with the object itself. What they want from finding aids is enough information to be able to plan their visits to view collections. The arrangements for access to objects and the level

of support provided for researchers vary considerably, with few museums having clearly formalised policies in all areas. In order to make their visits as productive as possible, researchers need to know what to expect before they visit, and be aware of policies in respect of handling, loans, sampling, etc.

Museums will need help from MLA, the Museums Association and other bodies in implementing this recommendation, and we suggest that MLA and the Museums Association support museums and other collections in developing 'researchers' charters', that set out the services and facilities they offer including:

- how to contact the museum and individual curators, and to make appointments with them
- what equipment and facilities are provided, e.g. scientific equipment, workspace
- restrictions on use of objects including destructive analysis and sampling
- loan arrangements
- access to related documentation
- facilities to browse collections, and access to stored objects
- the information researchers are expected to provide, such as the accession numbers of objects they wish to view, and
- any handling restrictions relating, for example, to fragile objects.

3. The nature and quality of catalogue records

All online catalogues and portals should make clear on their website home page the nature and scope of the records on which they are based.

Researchers want finding aids to be provided online as quickly as possible. Ideally, they should provide accurate information; wide coverage; digital images; links to other relevant sources of information such as research papers and information about objects' provenance and their international scope and coverage. Researchers also want to go beyond collection level to item-level descriptions, including the provision of images. No museum can meet all these requirements in the records for all its collections, and researchers recognise that the requirements set out above are not absolutes, but ideals to aspire to: the nature, quality and accuracy of catalogue records will vary both within and across museums. The key for researchers is rather that any finding aid

should make clear the nature and the scope of the records on which it is based.

4. Dealing with backlogs and enhancing existing records

In dealing with backlogs and enhancing existing records, curators should establish, with advice from researchers where possible, clear criteria for determining whether and in what circumstances collection-level or group, as distinct from item-level, descriptions are appropriate.

In making decisions on dealing with backlogs, museums and other collections should bear in mind that once records are available online, researchers and other users can more readily enhance and update them. We suggest that:

- Collections Trust and Collections Link should develop guidance on ways of coping with backlogs, using bulk cataloguing or grouping objects within specific subject areas and should consult with the research community through the Specialist Subject Networks on the form of cataloguing that will best suit their needs.

5. Including images and contextual information

Online catalogues should wherever possible include images, and also notes about and links to, sources of relevant contextual information.

Researchers attach particular value to being able to see images of objects. In some cases, images can be more valuable than a detailed description in enabling researchers to make a decision on whether or not to visit a collection. While 2D images are particularly helpful in art history, developments in 3D imaging have great potential in many subject areas.

Researchers are also often as interested in contextual information about objects – including their history and provenance, details of previous research relating to them, publications and so on – as in the objects themselves. Ideally, they would like to see such information linked to the object record. In most museums, however, even if the information is available at all, it is likely to be kept separate and available only through the curator. Wherever possible, hyperlinks should be established between catalogue records and the sources of such contextual information. This would be of interest and value far beyond the academic research community.

Researchers themselves are among the major contributors and creators of such contextual information. Most of them present a copy of the reports and papers they produce to the museums they have worked with, although they are often not clear as to how museums and others make use of such information.

To help museums and others implement this recommendation, we suggest that:

- Collections Trust should provide advice on how museums can most efficiently and effectively add images to their online databases.
- Collections Link and appropriate Subject Specialist Networks should advise on how to include in catalogue records information about sources of relevant contextual information, and
- relevant learned societies and professional associations, as well as research funders, should remind researchers of the obligation to submit to museums copies of reports and publications that are based on objects researched within the museum.

6. Engaging with researchers

Researchers should be encouraged to submit amendments and enhancements to catalogue records, and curators should establish systems for handling such input from researchers, including the exploitation of Web 2.0 technologies.

Researchers themselves are major sources of information and expertise about objects and collections. Whether they are researching objects for the first time or revisiting old records and reinterpreting, their findings can be used to update or amend existing records. Some researchers already provide to curators information and suggested amendments to records, but there is potential to exploit their knowledge much more systematically.

Direct interaction between researchers and curators should be facilitated by developments in Web 2.0 technologies and services including blogs, wikis and social networking sites, as well as by the Semantic Web. It is now relatively simple to establish systems to allow researchers and other users to submit amendments and enhancements direct to online catalogues (if necessary after moderation by a curator). A few museums are already experimenting with these technologies. This has the potential to help all museums and collections to improve the quality of their catalogues, as well as to improve the links between researchers and curators.

To implement this recommendation, we suggest that:

- relevant learned societies and professional associations should encourage researchers to provide amendments or enhancements to catalogue records, and
- MLA, the Museums Association and other relevant bodies should provide guidance to museums and other collections on the arrangements for handling such input from researchers.
- the Museums Association and other relevant bodies should develop guidance for museums on developing and implementing Web 2.0 and semantic web approaches to their catalogues; and
- Subject Specialist Networks should establish a dialogue with relevant learned societies and professional associations on how researchers can most effectively make use of such technologies to provide input into the development of museum finding aids.

7. Cross searching and linking

All online museum and collection databases should be made available for cross searching through Collections Trust/Culture 24 Integrated Architecture Project.

Researchers are mainly interested in finding and locating objects of a particular kind, and relevant information relating to them, rather than in the contents of a particular museum or collection. Cross searching and aggregations of data on specific kinds of objects, or objects relating to a specific subject area, are high on the list of researchers' wants. Trawling through several different websites is neither an efficient nor an effective way of finding and locating objects that may be relevant to a research project.

The services provided for researchers in searching for objects are far behind what is provided for them in searching for textual material in libraries and archives. Only a few subject-specific services have yet been developed, and some of those are highly restricted in scope and the extent of their user base, with question marks about their sustainability when project funding comes to an end. Initiatives to establish links between databases of objects and of textual information in library catalogues and elsewhere are as yet in their infancy. Contrary to the views and expectations of many researchers and museums staff, the museum catalogues that are available online are mainly not findable through Google or other general web search engines.

A number of steps could be taken to improve the current

position, including the further development of Collections Trust/Culture 24 Integrated Architecture Project (IAP). This will be capable of providing direct access to object-level descriptions from individual museums, though its value for researchers and others will depend on the success of the policies of MLA and other funders in encouraging museums and other collections to make their records available to the service. To implement this recommendation, we suggest that:

- MLA should work with other funding bodies (including AHRC, HLF, and JISC) to ensure that online databases produced with their support are made available through the IAP
- MLA should discuss with national museums a mechanism for including existing and planned online databases in the IAP, and
- MLA should work with Collections Trust and Subject Specialist Networks to provide a mechanism for including all other online databases of objects in the IAP.

8. Raising awareness and exposure to search engines

Museums and other bodies should take active steps to make researchers aware of the nature and value of current and new online finding aids, and should work with collections management software suppliers to ensure that their records are findable through Google and other search engines

Most of the researchers we spoke to were unaware of the online finding aids currently available or being developed, even those designed with researchers in mind. As new services like People's Network Discover are developed further, active steps should be taken to ensure that researchers as well as other users are made aware of them. More links between researchers' and curators' networks would encourage better communication.

In addition, while the People's Network Discover service has the facility to link to general web search engines such as Google, very few other UK museum catalogues are directly searchable via such engines, including services such as Google Images. Urgent steps are needed to remedy this situation, and also to ensure that records are in a form that facilitates harvesting for other services under protocols such as the OAI-PMH.

To implement this recommendation, we suggest that:

- MLA and Collections Trust should work with the Subject

Specialist Networks to communicate information about existing and new online services to researchers through their learned societies, professional associations and other relevant networks.

- MLA and Collections Trust should work through the People's Network Discover and Culture 24's Integrated Architecture Project to provide guidance on making online records directly searchable by general web search engines, and harvestable under protocols such as OAI-PMH.

9. Funding and collaboration

MLA should work with funders and other agencies to encourage and support projects to develop and enhance high-quality online catalogues, particularly those that involve collaboration between researchers and curators responsible for several collections.

The needs of researchers are not a key priority for major funders such as the HLF and MLA. Nevertheless, projects funded by these organisations have been, and will continue to be, of critical importance in increasing the coverage and availability of catalogue records for individual museums and for subject or regional groupings. It is important that funders are aware that creating and making available high-quality catalogue records, plays a central role in underpinning the support for research and education and also makes a valuable contribution to the community at large.

It is important also to recognise, however, that project funding can lead to piecemeal approaches, and may bring the risk of concentrations of resources in a few larger museums and the skewing of the coverage of the object records that are available online. That is a particular danger from the perspective of researchers, who are often interested in cross searching and in aggregations of records from a wide range of museums, local as well as national.

To implement this recommendation, we suggest that:

- Funders including MLA, AHRC and JISC should actively encourage and support projects to develop and enhance high quality online databases, particularly those that involve consortia that include smaller, or less well funded, collections that would not otherwise be available online.
- MLA should encourage Renaissance in the Regions Hubs to collaborate with, and support, smaller museums in enhancing the records of their holdings and their finding aids, and in securing project funding to do this.

10. Linking library and museum catalogues

MLA and other agencies should work with museums and libraries to explore the potential for linking databases of objects and of textual information.

It is relatively rare for an object to be the sole focus of a researcher's interest. Researchers generally wish to gain access to a wide range of information sources, many of which will not be directly related to the specific objects they are investigating. Links and interoperability between sources of textual information and museum catalogues are very desirable for researchers, but rarely exist currently.

A few librarians in the university and research sectors who also have responsibility for museum collections, like the Wellcome Library, have begun to explore the potential for such linking, but much further work is needed to develop good practice examples and encourage others to follow suit. To implement this recommendation, we suggest that:

- Collections Trust should investigate with library and museum system suppliers the potential for the cross searching of systems, and
- JISC and other funders should support projects to explore and promote the potential for links between the museum and the library communities.

HLF

Heritage Lottery Fund

Hub Museums

The Hubs are part of the national Renaissance Programme for Museums established by the MLA in 2003. There are nine Hubs, one in each of the English regions. Each Hub is a partnership of up to five flagship museums and museum services which may include independent and university museums as well as local authority services. The Hubs are leaders in developing improvements in museum services in their regions.

ICOM

International Council of Museums

IAP

Integrated architecture project

IHR

Institute for Historical Research

JISC

Joint Information Systems Committee

MA

Museums Association

Metadata

Metadata is data about data – it describes how and when and by whom, the data was collected and how it is formatted

MICHAEL

Multilingual Inventory of Cultural Heritage in Europe

MLA

Museums Libraries and Archives Council

MODES

Museum Object Data Entry System

MUA

Modes Users Association

Museums and Galleries Yearbook

Produced by the MLA, this is a catalogue of over 3000 entries on museums and galleries in the UK

NIMC

Northern Ireland Museums Council

NIRP

National Inventory Research Project

NMDC

National Museums Directors' Conference

OAI-PMH

Open Archives Initiative Protocol for Metadata Harvesting

OPAC

Online Public Access Catalogue

PAS

Portable Antiquities Scheme

People's Network Discover

The People's Network Discover services began by providing computers in public libraries, making high-speed web access available to everyone. The network in libraries offers over 60 million hours of computer use every year, most of it free, with access to a wide range of software and digital content. The Discover service is a cross-domain portal searching across a wide range of institutional databases

Renaissance in the Regions

Run by the MLA, Renaissance in the Regions is a funded programme to transform England's regional museums

RIN

Research Information Network

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The appendices for this report are available in a separate document at the website address above.

About the Research Information Network

Who we are

The Research Information Network has been established by the higher education funding councils, the research councils, and the national libraries in the UK. We investigate how efficient and effective the information services provided for the UK research community are, how they are changing, and how they might be improved for the future. We help to ensure that researchers in the UK benefit from world-leading information services, so that they can sustain their position as among the most successful and productive researchers in the world.

What we work on

We provide policy, guidance and support, focusing on the current environment in information research and looking at future trends. Our work focuses on five key themes: **search and discovery, access and use of information services, scholarly communications, digital content and e-research, collaborative collection management and storage.**

How we communicate

As an independent voice, we can create debates that lead to real change. We use our reports and other publications, events and workshops, blogs, networks and the media to communicate our ideas. All our **publications** are available on our website at **www.rin.ac.uk**

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