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Editors

Sally MacDonald
University College London Museums and Collections
UCL, Gower Street
London WC1E 6BT
United Kingdom

Nathalie Nyst
Réseau des Musées de l'ULB
Université Libre de Bruxelles – CP 175
Avenue F.D. Roosevelt, 50
1050 Brussels
Belgium

Cornelia Weber
Humboldt University of Berlin
Hermann von Helmholtz-Zentrum für Kulturtechnik
Unter den Linden 6
10099 Berlin
Germany

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Putting University Collections to Work in Teaching and Research



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Microcosms: an introduction to an interdisciplinary museum project

BRUCE ROBERTSON

Abstract

This paper summarizes the questions raised by the research of Microcosms, an interdisciplinary, multi-campus research project at the University of California. This project considers the role of material collections in the modern university, within an historical perspective, and comes to several broad conclusions.

The research that underpins the organization of the 9th annual UMAC conference, “Putting University Collections to Work in Research and Teaching”, was done within the context of Microcosms, a multi-campus research project of the University of California, co-directed by Rosemary Joyce, Mark Meadow and myself. What follows is based upon our collective work in this project. The project, beginning informally ten years ago, has the goal of analyzing the uses of material collections in the modern university, seen within an historical perspective, and projected into the future. That is to say, using the UC system’s material collections as our case study, we wish to understand the historical processes involved in the formation, use and continued functionality of university collections.

By way of clarifying what we see as some of the fundamental properties of university material collections, it is worth considering them for a moment in contrast to university library text collections, which tend to be contained in highly visible, centralized and unitary structures, a visibility which is matched by their administrative visibility, uniformity and centrality, in terms of budgets, staff classification and organization, and reporting structures, not to mention their near-universal uniformity of cataloguing systems. In contrast, as we know too well, university material collections typically lack that visibility, centrality and uniformity.

By choosing to look at university material collections, we have been forced to examine not just formal collections (i.e., museums) but also informal, ranging from departmental research and teaching collections to personal research collections that permeate every aspect, corner and function of universities. We have come to five broad, over-arching conclusions about the nature of material collections within the university (which we do not limit within the barriers of official museums).

First, the walls between collections, and types of collections (from formal to informal), and between collections and, shall we call them, assemblages of stuff, are very porous. Art museums erect the highest registrarial walls, but even these are less high than their civic counterparts. It’s a safe rule of thumb that any object entering the gravity pool of the university has the potential of ending up in formal and permanent university collections. And these material collections – or ‘realia’ – infiltrate even library special collections.

Second, the roles of these objects and collections are varied: teaching and research are the two prime ones, but many objects satisfy an historical or institutional function. Moreover, objects move from one to the other function, and in no particular cycle.

Third, the growth of material collections is instantaneous, constant, informal and substantial. Attempts to cut back on this growth are seldom successful: a particularly good example is the growth of natural history collections. UCLA, for example, got rid of their natural history collections but somehow retained the bird specimens (due, no doubt, to the protests of one senior professor) and also has a faltering but still living botanical garden. UCSB’s natural history collections were founded by the beloved first chancellor of the campus, Vernon Cheadle. After a near-death experience for his research materials housed by the university (after Cheadle’s actual death), when his 64,000 slides were shoved into a

tiny storage room, the Cheadle Museum now thrives as a proper museum. UCMerced, the newest of the campuses, and active little more than five years (the first class just graduated), has the Sierra Nevada Research Institute, and the California State Mining and Mineralogy Museum affiliated with it.

Then there are the collections that either won't go away or suddenly appear. UCDavis has a bicycle museum that no one is quite sure what to do with. And on a more global scale, campuses are flooded with scientific instruments that have been outdated by digitization, but ... what to do with them?

Fourth, the organization and the contents of collections are surprisingly personal and ephemeral – and there's interesting work to be done mapping the dynamics of functionality and organization against the change in disciplines, since most collections are closely related to particular disciplines. Here, again, natural history collections provide the most obvious example. But this is true in many other disciplines: where, for example, should geology collections reside when geology departments investigate crustal processes and not rocks and minerals?

Five, university museums constitute themselves within wild heterogeneity. We do not blanch at a text collection ranging from dance to physics – that's what university libraries are all about, as text acquisition is mapped against departments and programs. But a physical collection that contains Nobel Prize medals *and* the scarf that killed Isadora Duncan seems more than a little bizarre (UCIrvine's library). It seems a good deal odder when we realize that UC's libraries nearly all, so far as we can tell, contain as objects of collection and study, bottles and vials of fluids: petroleum (UCSB), wine (UCDavis), beer (UCLA).

In conclusion, the historical and theoretical work on university museums and their future must be undertaken and must be a priority, if we are to understand universities and the academic disciplines that are their *raison d'être*. A collection is really the result of a question, and questions (i.e., disciplines) always change. If collections are isolated from new questions, then they become moribund. Ironically, while we reach to the past to understand them, it is only as they make claims on the future that they will survive.

Contact

Bruce Robertson, PhD

Professor, History of Art and Architecture

Address: University of California, Santa Barbara, CA 93106, USA

E-mail: brobertson(at)arthistory.ucsb.edu

Relocation and revaluation in university collections, or, *Rubbish Theory* revisited

MARK A. MEADOW

Abstract

Objects move from place to place, discipline to discipline, into and out of collections within the university (even at times into and out of the university). In the course of these relocations, these objects also continually change in function and in value. By looking at university collections in a holistic and trans-disciplinary manner, a model of multiple, simultaneous and highly dynamic value systems better explains how such transformations are possible. Within the contexts of the university and of the theme of this conference, "Putting University Collections to Work in Research and Teaching", understanding these processes – migration, disciplinary shifts, alterations in the utility and worth assigned – is essential to making smart policy decisions concerning the stewardship of all university collections. In this paper, I look toward and beyond models of object circulation and revaluation such as Michael Thompson's Rubbish Theory to explain how these metamorphoses take place.

Introduction

The theme of the 2009 University Museums and Collections conference, *Putting University Collections to Work in Research and Teaching*, was chosen in order to place a spotlight on the crucial relationship of material collections to the core missions of the university. Given the financial issues today facing higher education globally, it is vital that museum and collections personnel, academic staff and university administrators be made aware of the absolutely central role that material collections of all types play in the successful work of the university. Collections require staff, funding and, above all, space, perhaps the scarcest of university resources. Many university museums and collections increasingly find themselves in the position of having to justify their development, upkeep or even existence. The pressures that collections face, however, do not only come from university administrators looking for ways to trim budgets. Changes in disciplinary practices, such as the general movement away from taxonomy in the natural sciences, and changes in disciplinary formations, seen in the fissioning and fusioning of departments across the university, can have equally profound consequences for material collections.

Universities, generally speaking, have paid remarkably little attention to their collections as a whole. There are few universities that have attempted to identify what collections they possess and fewer still that have instituted policies concerning the stewardship of those collections. Starting in 2000, the Office of Research of the University of California Office of the President authorized a study of the material holdings of the entire ten-campus University of California System. *Microcosms: Objects of Knowledge*, or more informally *The Microcosms Project*, sought to survey and analyze the values, functions and future of UC collections. Professors Rosemary Joyce, UC Berkeley, Bruce Robertson, UC Santa Barbara, and I co-directed the Microcosms Project. What none of us imagined at the outset was the sheer scale of the UC collections. Ten years later, we are still working with approximations, which have continually been revised upwards as our research progressed. Our current estimates are that there are over 150,000,000 objects and specimens in the formal collections of the UC system, omitting an undetermined amount of 'dark matter': i.e. those artifacts which haven't (as yet) been organized into institutionally designated collections. A rough estimate of replacement costs – what it would cost today to constitute collections of equivalent size and value – falls between \$40-50,000,000,000. These are by any standards enormously valuable resources, yet not one position in the UC Office of the President includes the oversight of material collections within its job description,

nor is there any set of policies in place to guide campuses or departments in decision making concerning them.

On what basis, however, would such stewardship policies be created? Our experience has been that decisions are made about the fate of collections at a highly local level, often without consultation either vertically within the administrative hierarchy or horizontally among cognate disciplines or collections to consider the broader impact of different actions. Furthermore, such decisions about collections are also usually made from a temporally restricted perspective, by which I mean that only the very most immediate financial, social and, for purposes of this article the most relevant, disciplinary conditions are taken into account.

Migrating objects and changing values

Among the major insights that we gained from our broad survey of UC collections is the realization that neither collections nor disciplines are stable entities. Arguably, one of the only constants about disciplines is that they seem to reinvent themselves on a regular, cyclical basis. Over a given period of time, the accretion of new research questions, new methods, new technologies and even new subject matter results in enough change within a discipline as to constitute an essentially 'new' field of study. Using Tony Becher's very apt metaphor of 'urban' and 'rural' disciplines, the well-funded and more densely populated fields (i.e. those with many scholars at work simultaneously on the same questions) transform rapidly, while the poorer and more sparsely settled disciplines change much more slowly (BECHER & TROWLER 2001, 106–108). At the moment, the biological sciences appear to be metamorphosing the most rapidly (15–20 years), while comparatively stable fields like classics have the slowest cycles. My own discipline of art history perhaps qualifies in these terms as a mid-size town, with a cycle of about 30–40 years.

Much the same can be said about university collections. Not only do most collections within the university continue to expand but also new collections are constantly being formed, and old collections are dissolved, discarded or destroyed. Others change locations, owners and functions over time. Indeed, viewed from a sufficiently long historical perspective, it becomes clear that objects and collections are in constant circulation and change functions and values in the process. This last point is what I will address in this article.

Leiden University's *Byzantium sive Constantineopolis (Panorama of Constantinople)* by Melchior Lorichs, 1559, exemplifies how objects can change radically in value over time. Lorichs, an artist from Schleswig-Holstein, in 1555 accompanied Ogier Ghiselin de Busbecq on a diplomatic mission to the Ottoman court.¹ Lorichs's sojourn in Istanbul lasted three and half years, during which time he produced numerous portrait drawings and sketches of architectural and artistic monuments. The most grandiose of his images from this period is the *Panorama of Constantinople*, originally in a scroll format measuring 4.5 x 11.5m. Likely based upon *plein air* sketches made on site, Lorichs created the *Panorama* after his return to Vienna. It somehow came into the possession of Nicolaas Stalpaert van der Wiele, the university *rentmeester* and the son-in-law of Janus Dousa, who was a statesman, scholar and the first librarian of Leiden University. Van der Wiele donated it to Leiden University in 1598, to be installed along the wall of the university library, as is shown in a 1610 engraving of the library by Jan Cornelis Woudanus. So prominent a display space, in one of the university's primary sites of knowledge production, strongly suggests that the university highly valued the *Panorama* from the moment of its accession. It remained on view in the library until 1653, when it was removed due to a shortage of space. From this date, its provenance is unknown until 1856 when it was discovered –

¹ Melchior Lorichs (Lorck, Lorch), 1526/27 – after 1583. The authoritative source on Lorichs is Erik Fischer's monumental *Melchior Lorck*, 5 vols., Copenhagen: Vandkunsten Publishers, 2009.

badly damaged and gnawed by mice – in an attic room of the city hall. During restoration, the original cloth scroll was divided and mounted on 21 panels. The *Panorama of Constantinople* is now located in the University Library's *Prentenkabinet*. The library web page devoted to Lorch's monumental work concludes by stating that it:

„Behoort dus tot haar oudste bezit en wordt beschouwd als een van haar kostbaarste kleinoden“.²

[It thus belongs among (the university's) oldest possessions and is regarded as one of her most precious jewels.]

Thus, over a 450-year history, the Lorch's *Panorama* changed in value and function several times. Created as a highly detailed presentation of up-to-date information concerning the architecture and fortifications of sixteenth-century Istanbul, it starts its career at Leiden as a gift of a well-connected officer and a prized knowledge artifact of the early university, then fades into obscurity as a piece of discarded, forgotten rubbish, and is reclaimed as an artistic treasure and a historical relic belonging to Leiden University's institutional memory. And, just to bring things full circle, the *Panorama of Constantinople* returns to Istanbul from June 5 – September 4, 2010, on loan from Leiden University for the exhibition *From Byzantium to Istanbul: 8000 Years of a Capital*, Sakip Sabanci Museum, Sabanci University, Istanbul.

At the beginning of the Microcosms Project we were told a story about the formation of UC Berkeley's collection of historical microscope, which reveals a more complex process of transition and transformation. We later discovered the story to be largely (but not entirely) apocryphal, but the principles it revealed nonetheless hold true. Several years ago, so the story goes, a new professor in history of science, whose specialization was in scientific instrumentation, was hired at Berkeley. In the course of his daily activities, this unnamed professor kept noticing old microscopes in various places. Some of the microscopes showed up in hallway display cabinets as curiosities or tokens of institutional memory – Professor So-and-so's microscope with which he did his ground-breaking work on x – or on top of bookcases or tucked into corners – obsolete instruments that nobody had bothered to throw away.

This narrative of multiple, shifting values and uses resembles the history of the Lorch's *Panorama*. Senior scientists with substantial research funding buy microscopes, and other scientific instruments, on a regular basis. Their slightly older microscopes are passed down to more junior researchers who do not yet have major grants of their own. From there, the instruments make their way to the desks of mere research assistants or graduate students. The next step, once outdated and devalued sufficiently, is to undergraduate teaching labs. Finally, having reached a point of obsolescence, microscopes and similar instruments are relegated to the status either of sentimental or institutional memory – the ones in the display cases – or as rubbish, albeit rubbish that is not discarded.

The sequence just described traces not just a series of functional changes to how the microscopes are used but also a disciplinary change. A microscope enters the university as a practical research instrument and it retains this use even as it is handed down the social hierarchy of the sciences. Almost certainly, it will simultaneously be used for instructional purposes along the way. The balance shifts once it enters a teaching, rather than a research, laboratory. Students still do minor research with their instruments but oriented toward pedagogical ends. The transformation of the instrument into either memorabilia or rubbish is a more substantial break, in which the microscope reaches its lowest point of value as a scientific tool. This loss of research value is paralleled by a loss of market value, of course.

² Stable URL: bc.ub.leidenuniv.nl/bc/goedgezien/objectbeschrijvingen/object045.html (accessed September 6, 2010).

The most significant change happens, however when the microscopes are gathered together into a historical collection. In this context, they return to scholarly functionality and regain research and knowledge value but now as objects of research in their own right, rather than instruments for performing research on something else. They have also shifted from the physical sciences to the humanities, from science to history of science. Microscopes within the collection can retain or even gain an enhanced role in institutional or sentimental memory, since the opportunities for collecting and conveying narratives about them is much greater than in a lab (though likely at a greater remove from living memory). Two other points about value are worth noting. The first is that their market value increases again, since they have attained the status of collectibles. The second is that their historical research, market and pedagogical values are enhanced by their presence in the larger collection, since they now serve as points in a series.

As mentioned above, this story is largely apocryphal. The vast majority of the instruments in U.C. Berkeley's *Golub Collection of Historical Microscopes* were not found on campus. They were instead donated by an alumnus, Dr Orville Golub, who had made a career in medical diagnostics outside the academy, and his wife Ellina Marx Golub. Nonetheless, there is a grain of truth in the original story that confirms the overall lesson: at least a few microscopes found at U.C. Berkeley have been added to the Golub collection. But even the instruments donated by the Golubs will reveal similar narrative patterns from the time of their manufacture and original use up to their accession by the university.

Models: *Rubbish Theory* and others

In his book *Rubbish Theory: The Creation and Destruction of Value*, the anthropologist Michael Thompson offers a starting point for understanding the processes by objects gain and lose value as they pass circulate over the course of their 'lives' (THOMPSON 1979). Thompson is primarily concerned with commodities – automobiles, vases, souvenirs and the like – and only considers two forms of value: market and aesthetic value. Objects enter into circulation upon manufacture, in almost all cases immediately declining in (market) value. Goods in this state of steady loss of monetary worth Thompson names 'transient'. After a sufficient period of time and use, these things fall out of use but remain in existence, becoming 'rubbish', with the potential either to be consumed entirely, i.e. destroyed, or to be reinvested with both economic and aesthetic value, at which point they become 'durables'. In Thompson's model such durables have a fixed, high value and would be removed from further circulation, which he associates with being accessioned into a museum.

Rubbish theory at first appears quite tidily to account for such university artifacts as the Lorichs *Panorama of Constantinople* or the UC Berkeley microscopes. But there are some prescriptions within the model that are problematic. For example, Thompson qualifies certain transitions as 'possible' and disqualifies others as 'impossible'. He allows goods only to move from a transient state to become rubbish, and from rubbish they can either be destroyed or become durables. Movement in the other direction, from durable to either transient or rubbish, is not allowed in this system.

Tied as they are to the missions of the university in general, and to particular disciplines in specific, objects within the university not only circulate quite freely in and out of these states but can even exist in more than one at the same time, as perceived from different disciplinary perspectives. As the life sciences moved away from the taxonomy and the study of individual organisms in the 1970s, 80s and 90s, and toward such fields as biochemistry at one end of the spectrum and systematics at the other, led to the wholesale discarding of entire, formerly prized collections. Many collections were treated quite literally as rubbish, given away to whoever was willing to recycle them or tossed into dumpsters. More recently, however, with advances in genomics and ecological toxicology, historical specimen collections have gained a new lease on life, becoming highly valuable research resources once more.

The emergence of new technologies that make use of such devalued collections does not necessarily guarantee their survival, as the case of the Woodhouse Mineral Collection at the University of California Santa Barbara demonstrates.³ The collection was formed by Professor Charles Douglas Woodhouse and others in the course of field research related to the mining industry, mine shafts offering unique opportunities to acquire otherwise inaccessible specimens. Over time, the collection grew into a substantial species collection, holding approximately 2,500 out of a total of around 4,000 known species, including a number of type specimens such as the eponymous Woodhouseite. Functioning primarily as a teaching collection for mineralogy courses, the Woodhouse collection was used actively for several decades. However, analogously to the bio-sciences, the rise of interest in earth systems and a resulting decline in interest in taxonomic mineralogy has led to the decreased use of the collection within earth science at UCSB. The collection is now housed in a basement room, which has remained available only because it periodically floods. Emeritus Professor William Wise has been the sole curator of the collection for past 14 years on a volunteer basis, since the collection has no operating budget.

Nonetheless, the collection has seen increasing use by researchers outside earth science, especially in relation to materials science, which draws upon chemistry, chemical engineering, physics and a number of other physical sciences. Neither the Materials department, nor the related science and engineering departments have the interest or the expertise to curate this collection themselves. The fate of the Woodhouse collection, once Professor Wise is no longer able to care for it, is unknown. Since neither UCSB nor the University of California system have a policy on the stewardship of collections for posterity, any decision regarding the collection will be made at a local level, within the earth science department.

An analogous, if still more dire, case study is that of the collections of Greifswald University's Geologische Landessammlung Vorpommerns, in the university's Paläontologisches Institut.⁴ The collection, which dates back to the Mineralien Kabinett of 1777, has over 3,000,000 specimens of minerals, fossils and other geological/paleontological materials estimated to be in its possession, though the exact number is unknown, since no comprehensive survey has ever been possible. During comprehensive, government-enacted reforms in higher education in 1968, the collection suddenly lost most of its storage and display space. The majority of its holdings are now housed in an unfinished basement of the building, in old wooden crates precariously stacked one upon another. Pervasive moisture has created ideal conditions for pyrite oxidation, resulting in severe problems with deterioration. Only a very small percentage of the ca. 2,500 type specimens in the collection can be located. Staffing is also a major problem, since nearly the entire paleontology staff was relocated to Rostock University (although the collection remained at Greifswald) in the name of disciplinary consolidation. The most urgent need is for simple utility shelving; next most important will be a systematic survey of the collection by a team of specialists to identify the most important holdings, especially the type specimens.

Conclusions: Policies on the stewardship of university collections

On April 15, 2009, in a document entitled *Konzept für den Aufbau eines Generalinventars zu den Sammlungen der Ernst-Moritz-Arndt-Universität zur Unterstützung der vergleichenden und interdisziplinären wissenschaftlichen Erforschung des Sammlungsbestandes*, Greifswald University agreed

³ This account of the Woodhouse Mineral Collection is based upon interviews conducted by the author and Rachel Johnson with William Wise, Emeritus Professor of mineralogy and curator of the collection, in April, 2007.

⁴ This account is based primarily upon an interview with Prof. Dr. Ingeborg Hinz-Schallreuter, paleontology and historical geology, July 2, 2009. My research at Greifswald University was made possible by a generous research residency at the Alfred P. Krupp Wissenschaftskolleg in Greifswald.

upon instituting policy reforms concerning its material collection, beginning with the centralization of information. Given the direness of the situation in the geological collections and the worldwide financial limitations of higher education in the early 21st century, it remains unlikely that the situation can be fully remedied in a timely fashion. In the meantime, despite continued international interest in working with materials from the geological collections, they are effectively unavailable to researchers. With less research being conducted, justifying a large infusion of funding becomes increasingly challenging.

Our experiences within the University of California Microcosms Project, and my research at Leiden University and Greifswald University, consistently point to the need for universities to develop clear policy guidelines for the stewardship of university collections. Such policies ought to be developed not only in reference to the short-term, localized priorities of a given department or discipline, though these should certainly be taken into account, but also in reference to the university's long-term, comprehensive interests. Individual artifacts, specimens or instruments, as well as entire collections, may be of interest and use to researchers and teachers well beyond the narrow precincts of a particular discipline. Some means of assessing the broader utility of collections should form part of such a policy. Similarly, decisions about the fate of collections should be made with a sufficiently long-term overview of the cyclical processes by which disciplines redefine themselves, and by which new disciplines are formed.

In more specific terms, the recommendations of Professors Robertson, Joyce and myself on university policy concerning the stewardship of collections include the following:

1. Identify and survey collections, with specific attention to prior, current and projected future usage.
2. Include incipient and working collections, as well as formal museums.
3. Centralize information and planning. Making information about the nature and contents of collections available to scholars and students across the disciplinary spectrum will contribute to more efficient usage.
4. Approach university collections holistically. Individual collections may easily be dismissed; the totality of a given university's collections cannot be.
5. Base decisions on historical and long-term trajectories.
6. Base decisions on university-wide overviews.
7. Incorporate an assessment of the dynamic, simultaneous functions and value systems relevant to how individual collections are used.
8. Institute a central review process for determining the desirability of discontinuing or discarding collections.

As the papers delivered at the 2009 UMAC conference and the articles published here demonstrate, university collections remain vital, vibrant and essential resources for the very core work of the university. Given the tremendous resources already expended in developing collections (the estimated replacement costs of the material collections of the University of California dwarfs those of the UC library system, for example); the significance of these collections for academic, natural, cultural and national heritage; and their contributions to local, state and national economies, a central stewardship policy should be seen as a prudent institutional strategy.

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Contact

Dr Mark A. Meadow

Associate Professor, History of Art and Architecture

Address: University of California Santa Barbara U.C., Humanities Research Institute, Irvine, CA
92697-3350, USA

E-mail: meadow@arthistory.ucsb.edu

Museums between Enlightenment and Romanticism. Early nineteenth century roots and modern practices

PIETER TER KEURS

Abstract

The early history of the three large National Museums in Leiden, the Netherlands, is characterized by Enlightenment principles such as education, instruction and foremost rationalism. However, it would be a mistake to think that the history of these museums can be adequately described by referring to enlightened, rationalist ideas only. Partly as a reaction on enlightened rationalism the Romantic movement developed at the end of the eighteenth century. It is argued that the nineteenth century history of the three large national museums in Leiden can best be understood as a process influenced both by reason and structure as well as by irrationality and 'the absence of structure'. It is most likely that modern museum practices are also influenced by the two strong European intellectual movements mentioned above. The case of the Golden Helmet, a Roman helmet found in 1910 in the swamp of the Peel region, serves as an example of how old museums can learn from their own past and apply these lessons to present-day museum practices. In collecting, exhibiting and cooperation with local partners, it is better to acknowledge a tension between reason and emotion, instead of a development towards more rationalism.

Introduction

The three large National Museums in the small Dutch town Leiden were and still are firmly anchored in that powerful intellectual movement that we call the eighteenth century Enlightenment. Although all three were founded in the beginning of the nineteenth century, eighteenth century ideas dominate the mission statements of the three bastions of scholarship in the Dutch museum landscape. The National Museum of Antiquities was founded in 1818, the National Museum of Natural History in 1820 and the National Museum of Ethnology in 1837 (although some authors trace the origin of the Museum of Ethnology back to 1816, when the Royal Cabinet of Rarities in The Hague was founded (EFFERT 2008). Humanism, universalism and a strong belief in rationalism as a way to improve our knowledge of nature and culture were seen as important guidelines for the new museums. However, is it justified to describe the history of the Leiden museums (and many other museums) – which were so close to an academic, scholarly frame of reference – by means of reason and rationalism alone? In this article I argue that although the official policy papers, research plans and publications are full of, explicit and implicit, references to 'enlightened' ideas the reality of museum practices may show a completely different picture. Keeping this in mind, may give us some ideas on what to do with our collections, how to make our old collections more operational in a new, contemporary context.

Museums and the Enlightenment

For the very beginning the three national, 'Leiden', museums had strong ties with the University. The collections of the National Museum of Antiquities grew out of the University's collection of antiquities and coins, and for a long time the museums had to report directly to the Broad (*Curatorium*) of the university. There was however also a direct relationship to the ministry, and sometimes even the King, over passing the university. Particularly the Museum of Natural History and the Museum of Antiquities had a strong interest in scientific research and were therefore closely linked to the university (EFFERT 2008, 191).

A good example of how the founding of the national museums was rationalized - what kind of arguments were used - can be a memorandum of Philip Franz von Siebold, the founding father of the National Museum of Ethnology in Leiden, in which he pleaded for setting up an ethnographic museum:

“The human being, in his many-sided development under foreign climes, is therefore the chief subject matter of an ethnographic museum. It provides an invigorating, instructive and, therefore, useful material enabling the acquisition – whilst remaining on national soil – of knowledge about inhabitants of far away countries and the study of their particular characteristics.

Yes, it is even a moral and religious duty to busy ourselves with our fellow men and to learn to detect his good qualities, and thus to become more tolerant of his strange external appearance (which, without us knowing quite why, may even repel us), and help us to become closer to him” (cited in TER KEURS 2005, 17).

‘Instruction’, ‘acquisition of knowledge’ are typical late eighteenth century Enlightenment ideals. The ‘many-sided development’ of human societies (we would now say ‘cultural diversity’) is a slightly different matter, but I will come back to that later.

The ideals of instruction and education, combined with a strong belief in universal humanism, were closely linked with an interest in the Classical World. The Classical World set the example. Classicism became dominant in the European building tradition, since the Greeks and the Romans had, according to prevailing ideas, found the correct proportions for a building. A fine nineteenth century example of this is the new building of the British Museum, still fully functional at the moment. Museums, but also other buildings such as many *Palais de la Justice* in France were built as Roman temples. As if they had to replace churches. A notably example of an attempt to replace churches and religion by means of architectural structures in the classical style is the Pantheon in Paris. After 1789 the French revolutionaries were in need of new heroes to worship, particularly heroes who were a good example of the superiority of reason over religion. The Pantheon offered a place to honor the people who had been instrumental in stimulating the revolution. Until today the remains of ‘Great Frenchmen’ are put down in this secular temple of reason and intellect. It is of interest to know that the Pantheon was built on a site that was formerly occupied by a church (SHORTO 2008).

Although the French revolutionaries, up to Napoleon Bonaparte, justified their actions as coming straight from enlightened rationalism, they also evoked strong sentiments in other directions. The Terror and the imperialism of the French in the period 1789 to 1815 estranged many people from the ideals of the revolution. The way the French forced their ‘enlightened’ truth on the rest of the world, evoked reactions that, among other things, gave cultural diversity a more important place in the history of ideas than intended by many Enlightenment thinkers. The revolutionaries were convinced that their model of the ideal society could be applied to the whole world (Napoleon used it as a reason to invade Egypt, see STRATHERN 2007). When, at the end of the eighteenth century the German Romantic Movement became a forceful reaction to the French revolution, ideas about the specific characteristics of particular cultures became an important part of the intellectual landscape. Two heralds of the new times to come, reacting on enlightened rationalism were Johann Georg Hamann (1730–1788) and Johann Gottfried Herder (1744–1803). I will come back to the ideas of these two men below.

How crucial Enlightenment principles such as rationalism, classification, objectivity and progress were for European culture, even throughout the whole of the nineteenth century, is also stressed by the historian James Sheehan, who writes:

“Like the eighteenth century, the nineteenth was an age of collections, encyclopaedias, and dictionaries, which sought to bring together and classify knowledge of all sorts. ... [It concerned a] systematic study of the world. People in the nineteenth century wanted to chart every inlet, assemble every ancient text, create

grammars for every language, identify every species, explore every corner of the earth. Museum directors wanted to display a representative work by every great artist, zookeepers hoped to have every animal no matter how exotic, botanists every plant" (SHEEHAN 2000, 151).

The quest for antiquities and Romanticism

The first director of the National Museum of Antiquities in Leiden, Caspar Reuvers (1793–1835) (who was also the first Professor in Archaeology in the world), was also a child of the Enlightenment.

"For Caspar Reuvers' generation the Classics formed a completely self-evident part of daily life, of personal development and schooling, of society's institutions, and – through neo-classicist architecture – also of the image of government, academic and cultural buildings in the towns" (HOIJTINK 2009, 6; Translation P.t.K.).

Closely associated with the University the museums from the very beginning had a scientific profile. Research was considered to be of the utmost importance, so the museums contributed strongly to the image of Leiden as the centre of scholarship in Holland. All three founding fathers of the large Leiden museums also published important scholarly works and in all three museums scientific research remained important through their histories.

There was a strong belief in the positive effects of rationality for society, which also had a large impact on the industrialization. This can be illustrated by a citation from a lecture held in Berlin by the German industrialist Werner von Siemens (1816–1892).

"And so, gentlemen, let us not get sidetracked, we continue to believe that our research and our inventiveness brings humanity at a higher level of civilization, ennobles her, ..., that it will lessen hardships, banish illnesses, enlarge a joy in life, and that it will make humanity better, happier and more content with her faith" (cited in SAFRANSKI 2009, 304; Translation P. t. K.).

However, this belief in progress – ultimately reached through rational means - was already challenged since the days of René Descartes (1596–1650). The moment the ratio became a leading principle in European culture, an anti-rationalist counter-movement in various forms appeared. At the end of the eighteenth century these undercurrents took the shape of the Romantic Movement.

Isaiah Berlin paid ample attention to these fascinating undercurrents in European thought by asking attention for the works of Vico, Hamann and Herder (see BERLIN 2000, 2001). This undercurrent of anti-rationalism and finally Romanticism gained strength, as I mentioned above, in the period after the French revolution, since many people saw enlightened ideas as the cause of the violent period that followed the revolution. The end of the eighteenth century has been crucial in this respect. While Immanuel Kant formulated the apotheosis of rationalism in his three *Kritik* (Critics), in 1781, 1788 and 1790, the Counter-Enlightenment (a term first used by Isaiah Berlin) was already well under way. Kant's friend Johann Georg Hamann (1730–1788) became one of his most influential opponents, although the two friends continued to respect each other throughout their lives. Hamann argued that Kant was fundamentally wrong in classifying the world and even knowledge itself in such a rigid way. According to Hamann this resulted in a distorted view of reality, in which there was not enough attention for religion or feelings and emotions. Isaiah Berlin (2000, 272–273) formulated it as follows:

"Hamann rose in revolt against the entire structure of science, reason, analysis – its virtues even more than its vices. He thought the basis of it altogether false and its conclusions a blasphemy against the nature of man and his creator; and he looked for evidence ... in the empirically ... perceived facts themselves, in direct observation of men and their conduct, and in direct introspection of his own passions, feelings, thoughts, way of life".

Another issue was the claim that enlightenment ideas are universally valid. Not only Kant's analysis of human knowledge, but also his moral principles as formulated in *Kritik der Praktischen Vernunft* (1788) were applicable, according to him, to the whole world, to all cultures. Universality was the aim, diversity was the loser. Here, Johann Gottfried Herder (1744–1803), another German thinker, strongly argued in favor of attention for what we would now call cultural diversity, stressing the importance of local differences in languages and myths and legends. With this he led the foundations for disciplines such as anthropology and linguistics. And he did this before Kant published his famous three critical works. We should keep in mind what Von Siebold mentioned in his founding statement of the Museum of Ethnology in Leiden (cited above): The 'many-sided development' of human societies. It seems to come straight from Herder.

Both Hamann and Herder can be seen as the founding fathers of the Romantic Movement, in particular the German 'Frühromantik', with writers such as the Schlegel brothers (Friedrich and August Wilhelm), Ludwig Tieck, Novalis, Fichte and Schleiermacher (see SAFRANSKI 2009). All this took place in the revolutionist period of the last decade of the eighteenth and the beginning of the nineteenth century, when Napoleon developed from a hero into a villain, when stability was threatened, when the seeds were sown for European nationalism.

In short, Romanticism is characterized by an "absence of structure" (BERLIN 2001 [1999], 134), an acknowledgement that life cannot be grasped by system builders, that life and culture are fundamentally chaotic. Secondly, the Romantics did not believe in one ideal society that could be exported to other parts of the world as well. They had attention for folk stories, for language diversity and for local cultural differences. The individuality of a culture was found to be important, not the universality of one ideal model. Particularly in literature these two characteristics led to an interest in a part of human life that had been grossly ignored by eighteenth century rationalism: an interest in unconscious dark forces.

"There is no doubt, whatever else may be said about romanticism, that it did put its finger upon something which classicism had left out, upon these unconscious dark forces, upon the fact that the classical description of men, and the description of men by scientists or scientifically influenced men ... does not capture the whole of man. It recognised that there were certain aspects of human existence, particularly the inward aspects of human life, which were totally left out, so that the picture was distorted in a very violent degree" (BERLIN 2001 [1999], 138–139).

It will come as no surprise that "Kant hated romanticism. He detested very form of extravagance, fantasy, what he called *Schwärmerei*, any form of exaggeration, mysticism, vagueness, confusion" (BERLIN 2001 [1999], 68).

Let us go back to museums, particularly to the Leiden museums which are so clearly a product of the early nineteenth century. I already mentioned the first director of the National Museum of Antiquities, Caspar Reuvens. As an enlightened humanist he actively developed the museum for the education and learning of the people. In his view all antiquities, including Indonesian ones, should be part of his universal museum. In the archive of the museum there is a drawing made by Reuvens in which he sketched his ideal museum,¹ with the Javanese statues from the Netherlands East Indies as the centre of attention.²

¹ RMO/ARA 324, 15.1.1/1, 89.

² The Javanese antiquities were transferred to the National Museum of Ethnology in Leiden in 1903. Due to a change in policy the non-European antiquities were assigned to the Ethnology Museum and the antiquities of the cultures that were seen as the 'glorious' predecessors of European culture (Mesopotamia, Greek, Roman) remained at the Antiquities Museum.

It is not clear what Reuvens knew about the early Romantic movement in Germany and other European countries, but Friedrich Schlegel (one of the main representatives of the 'Frühromantik') wrote a study on Greek Poetry and Myths (published in 1797). We don't know (yet) if and how well Reuvens knew Schlegel, but somehow the ideas of the Romantic movement must have been in the air, especially since the post-Napoleonic era struggled with the formation of a new stability. And although the Romantics did not offer the required stability, through Herder's legacy they did offer an appreciation for local cultures, for the countryside, for myths of origin which formed the basis of nineteenth century nationalism (and *Blut und Boden*). This 'localization of culture' was an important element of the Romantic movement.

So how rational and how planned was the formation of collections for the new Museum of Antiquities? Or was there more "absence of structure" than we are so far willing admit?

Reuvens certainly did his best to rationalize all his acquisitions, but did the reality of collecting always follow Reuvens' ideals? No, it did not. Reuvens had agents in the field (in Italy, Greece, Egypt and Tunisia) and he instructed them thoroughly about what to collect for the museum. He certainly had clear ideas on what the new museum should look like and what its purpose should be. One of Reuvens' agents in the field was Jean Emile Humbert (1771–1839), a Dutchman who always wrote his letters in French, because he had difficulties with writing in Dutch. Being of an upper class family he had been raised with the French language, which was quite normal at the time. Humbert worked for Reuvens in Tunisia, but his later trips for the museums were mainly in Italy. Reuvens wanted Humbert to travel on to Tunisia again, but somehow Humbert managed several times to postpone the trip. In two occasions we know why he did not continue his trip.

1. He was informed that the Dutch consul in Tunisia saw him as a threat, since there was a rumor that Humbert's final aim was to become the new consul. And the Dutch consul wanted his own son to succeed him. Humbert decided to avoid a confrontation and stayed in Italy, not informing Reuvens of the real reason (HALBERTSMA 1995, 63–64).
2. At another occasion, some years later, Reuvens again had to insist to Humbert that he had to continue to Tunisia and again Humbert did not react the way Reuvens wanted. This time the reason was a relationship with a woman. Reuvens heard the rumor in Leiden and wrote a letter to Humbert informing him what he had heard. At the same time he politely informed Humbert that he was not the one to have spread the rumor (HALBERTSMA 1995, 71–72, 81).

These rather unscholarly reasons for not doing what his scholarly master wanted him to do did however result in the purchase, by Humbert in Italy, of a great Egyptian collection and a great Etruscan collection for the museum. At a third occasion Humbert bought a collection without the permission of his boss in Leiden. Reuvens and the minister were furious. However, this unscholarly behavior of an agent in the field gave the National Museum of Antiquities some collections that are still among the best in the world.

Humbert's actions show that he was certainly not a true rationalist, solely guided by enlightened principles. He was not like Alexander von Humboldt, who seemed only to have lived for "measuring the world" (KEHLMANN 2005). In the beginning of their cooperation Humbert and Reuvens had a good relationship, but later a distance was felt between Humbert's circumstances in the field and Reuvens' academic position. Reuvens had no real feeling with the situation in the field. And Humbert had his own problems. His first wife died at a young age and their daughter died a few years later. When finally he met Margarita Terrini, the Italian girlfriend Reuvens wrote about in his letter, he was not allowed to marry her since he was a Protestant and she a Catholic. We know that Humbert was, at times, an emotional and melancholic man, and Halbertsma concludes his study on Humbert with the

observation that “European romanticism had reached North Africa” (HALBERTSMA 1995, 152–154). “The image of the ruin as an illustration of the nullity of human efforts fascinated Humbert” (HALBERTSMA 1995, 156). This is indeed the attitude of a true Romantic.

Collecting ethnographic objects and the absence of structure

Collecting in the field often appeared to be less systematic than the official reports make us believe. To understand the practice of collecting one needs to have letters, diaries and other unofficial documents. These usually show a more reliable image of what actually happened in the field. We are then confronted to many examples of the discrepancy between official plans and actual reality. Although collectors do not always openly report all the relevant facts in their writings (not even in their personal notes), there is ample evidence that political circumstances, manipulations of local sellers and middlemen had a big influence on the collecting practices. Western collectors were strangers in the countries where they operated, so they needed at least some local support.

As in the quest for antiquities, in ethnographic collecting many examples can be found of selective collecting in the early nineteenth century (see HARDIATI & TER KEURS 2005; TER KEURS 2007). The early collections from the Netherlands East Indies (now Indonesia), stored in the National Museum of Ethnology under serial numbers 1 and 16, are good illustrations of how haphazard collecting took place. Again we have to start with a reference to Napoleon. In 1815, after the Battle of Waterloo, the French revolutionary and imperial periods came to an end. People longed for stability and the Congress of Vienna redefined the map of Europe. North of France a strong state was intended, combining Belgium and the Netherlands in one Kingdom. One of the princes of Orange was installed as the new King William I. Nationalism, and inevitably competition between nation states, became one of most powerful driving forces of the nineteenth century and the new Dutch King was very much aware of that. He wanted to create a powerful state with colonies and with national museums owning collections from all over the world, to show the glory of the state to the people. The three large Leiden museums were all three founded under the patronage of William I. Reuvens (Antiquities), Temminck (Natural History) and Von Siebold (Ethnology) could never have started ‘their’ museums without the support of the King. William I also founded, in 1820, the *Natuurkundige Commissie*, the Natural Science Committee. The members of this committee traveled around in the Dutch colonies in the period 1820–1836. Conditions were harsh. Most expedition members died because of illnesses or violence. Medical care, which greatly improved in the course of the nineteenth century, was still far from good and most of the archipelago was still unknown area. Contact with the local population was short and usually superficial and knowledge about the people the expedition members encountered was very limited. As a consequence, one can hardly speak of any systematic collecting.

Another issue hampered the systematic gathering of ethnographic objects. None of the expedition members was a professional anthropologist. The academic discipline anthropology did not yet exist and scientists who traveled were usually geographers, zoologists or botanists. Ethnography was done by several members of the natural science expeditions as something on the side. None of the reports (TEMMINCK 1839–1844; MÜLLER 1857) of the committee’s activities in the Netherlands East Indies contain any clear description of when certain objects were collected and under what kind of circumstances (SEDYAWATI & TER KEURS 2005, 26). The main focus was on specimens of natural history, not on ethnography.

Salomon Müller (1804–1864) was the only European, of many, who survived the expeditions of the committee. He was a German natural scientist who entered Dutch colonial service to do scientific work in the colonies. He published, as an editor, the ethnographic notes of the expeditions separately (in 1857), but the material he presented had already been compiled by Temminck in his earlier, official report (1839–1844). It was information that was gathered by many different members of the

expeditions. Nobody but Müller had survived to write about their experiences. Unfortunately, with only Müller's compilation of notes it remains impossible to reconstruct the collecting circumstances of the museum's earliest ethnographic collections from the Netherlands East Indies. Müller's name did however remain firmly anchored in the documentation of the Museum of Natural History (see eg. JANGOUX & DE RIDDER 1987). He probably gave priority to the natural sciences, as it was called in those days.

Müller also reports on early collecting on the south coast of New Guinea, visited in 1828.

"There were hours of communication in sign language – the Moluccan interpreters did not understand the local language – which appeared to go well until the expedition members decided to return to their boat because night was falling. The local people tried to prevent the expedition members from leaving in their longboat, and when this failed, they began to throw spears at them. The expedition shot at them, but without killing anyone. The group of local inhabitants ran into the forest in fear, some of them leaving behind their spears, dug into the mud. The members of the expedition returned to the bank to retrieve these abandoned weapons" (SEDYAWATI & TER KEURS 2005, 27).

Unfortunately, the weapons that were collected during this incident can not be identified in the New Guinea collection of the Ethnology Museum. Maybe they never reached the museum.

Whatever the details, the general picture is that the practice of early nineteenth century collecting for museums had more in common with irrationality, coincidence, politics and adventure than with rational planning, scientific priorities and objectivity. The tensions between the Enlightenment and Romanticism, between reason and emotions, between objective truth and politics, between universals and cultural differences, between system and "the absence of structure" (BERLIN 2001 [1999], 134) are clearly present in the history of collecting.

New practices for old museums

How can we use the observations I made so far for present day museum practices? Is it still of interest to know what our roots are made of? Shouldn't we look at the future instead of the past? With an example of a recent museum practice I want to show how useful, also in the present-day situation, it can be to be aware of the tensions between Enlightenment and Romanticism, between structure and chaos, between reason and emotions, or between cultural uniformity and cultural diversity.

In 2010 it is a hundred years ago that the *Peelhelm* was found, close to the small Dutch village Helenaveen (at present nearly 900 inhabitants). The *Peelhelm* is locally called the *Golden Helmet*, but in reality it is made of thin gilded silver. The helmet is very fragile and it can hardly have been used in battle, because it would have been useless as protection for the head. Its style is clearly one of Roman military helmets and the inscription incised in it confirms this observation. It says that the helmet "was made by Marcus Titus Lunamis, using nearly 370 grammes of silver sheets. Its owner belonged to the sixth cavalry unit of the Equites Stablesiani. On the right side of the helmet cap it says Stablesia VI" (HALBERTSMA 2009, 178; also see POULS 2006, 25). The helmet was found with some other objects, among which were coins dated from 315 to 319 AD. So the disposition of the helmet in the swamp of the Peel (the name of the region) probably took place in or shortly after the year 319 AD. We do not know exactly why the helmet was deposited in the swamp in the Peel. At that time the area must have been difficult to cross and even for Roman soldiers it might not have been a safe place to go through. For a long time the prevailing hypothesis was that a Roman soldier left the army at the Rhine after successfully serving in it for many years. As a farewell gift he was given the *Golden Helmet*, but in the Peel swamp he drowned and his precious possessions sank away to be buried for the next 1600 years. Recently, another hypothesis was put forward. It could be that the helmet, and

the accompanying objects, was in fact ritually deposited as a thanksgiving to the Gods since its owner had successfully completed his military service (VAN DRIEL-MURRAY 2006, 43–45).

The *Peelhelm* was found in 1910 by a local peat-cutter, named Gabriël (Gebbel) Smolenaars. He exhibited the helmet in his house and allowed people to see it for a small entrance fee. After some time Smolenaars became uncomfortable with the idea that burglars could also try to steal the helmet and therefore he seemed relieved that he could sell the object to the National Museum of Antiquities in Leiden, for 1200 guilders (at that time an enormous amount). In fact, the helmet had soon been identified as an object of national importance and it was felt as logical to make it part of the national collection of antiquities. Since then, it has been on display in Leiden.

The helmet was effectively separated from the region where it was found. There was no contact between the Peel and the National Museum of Antiquities in Leiden and the local interest in the object was seen as marginal to the national policies regarding antiquities and cultural heritage. However, the local people did not forget the helmet. A hotel/restaurant in Helenaveen was called *The Golden Helmet* and the local village centre was given the same name. On the bar in the village centre a modern motorcycle helmet lies, colored with gold paint. In the adjacent room a copy of the helmet is situated in a showcase and everywhere one sees posters with a photograph of the original helmet. The spot where the helmet was found in 1910 is marked with a stone monument.

The village Helenaveen finds itself in an underdog position. It is small and has little financial means by itself to make a strong profile to the neighboring villages and towns. However, there is a strong sense of belonging to one community. In 2009 Helenaveen was chosen as the 'Greenest' village of the Netherlands by Entente Florale, a national competition on how local people deal with their natural environment. In the report of the jury it was explicitly stated that "the inhabitants are very involved in the reconstruction of the area" (*De bewoners zijn zeer betrokken bij de reconstructie van het gebied*). And they are visibly proud of that. The inhabitants are very active in promoting Helenaveen and they also succeed in finding political support for that. As a result of this strong sense of belonging to the village – a "localization of culture" – the village counsel approached the National Museum of Antiquities with a request to get the *Peelhelm* on loan in 2010. The request was supported by a letter from the Mayor of Deurne (Helenaveen is part of the municipality of Deurne) and by mentioning other politicians such as the former commissioner of the Queen in the province.

All this triggered local competition. Within a few months there were, apart from Helenaveen, another three loan requests (from Deurne, Asten and Venlo) and it soon became apparent the museum could not hide behind the aloofness that is so characteristic for enlightened rationalism. It would have been easy to refuse on grounds of insufficient climate conditions or security procedures, but such a decision would be contradictory with recent national and provincial policies in which local cultural identities are given their proper value. It would also move the National Museum of Antiquities in a position of a conservative, national, aloof and imperialistic institution with the right to claim objects of national importance, but not sharing them with the regions where the objects came from. In short, it would – in the present political circumstances – force the museum in a defensive position. At the same time the museum has the responsibility to take care of the national collection of antiquities and it has the obligation to be critical with loan requests "in the interest of the objects". After all, the ministry finances the museum to curate collections of national importance in a professional manner.

Instead of flatly refusing to lend the *Peelhelm* to the region, the museum of antiquities choose to start talks with all parties involved. Apart from climate and security conditions the problem of local competition was clearly present in the talks. However, finally a decision was reached and the museum could announce that Helenaveen would get the *Peelhelm* on loan as the first venue and the Limburgs Museum in Venlo would be the second venue. The National Museum of Antiquities will help

Helenaveen to create the conditions necessary for this loan. After Venlo the helmet will return to Leiden to become part of a small exhibition to be shown to a national public again. This solution to the problem of dealing with four local loan requests concerning the *Peelhelm* is not favoured by all the parties involved, but at least the local newspaper *Eindhovens Dagblad* proudly announced: "Helenaveen 'gets' the Peelhelm!" Some people in the Peel are very happy.

Concluding remarks

The tension between enlightened rationalism, including a related aloofness from local affairs, and the Romantic claim to give importance to cultural diversity and to value local emotions is clearly present in the history of museums. It is a tension that should be recognized as an incentive behind the formation of collections, the way the collections are presented and the role museums play in national and local cultural politics. There is no movement towards more rationalism, towards a more and more enlightened museum politics (in the sense of a progressive movement based on the eighteenth century Enlightenment). The roles museums play, in the past and in present-day societies, will always be on the edges of structure and chaos, of reason and emotions and of universalism and diversity. In short, museums will have to take into account human nature and they have to play their role in the politics of culture at different levels.

Collection mobility is a key issue here. To build cultural and political bridges, which should be one of the major aims of museums (admittedly, this thought comes straight out of the Enlightenment), we need to use collections in a creative way. The *Peelhelm* case is one example, but there are many more to give. Museums need to show a willingness to see collections as active entities in the social political and cultural fields, without losing sight of the collection caring tasks they have. Museum directors and curators should have a constant critical mind on the possibilities and limitations museums have in the cultural field in which they operate. The major intellectual movements of the early nineteenth century are still very much present in museum practices. Collections should be used as active actors in a socio-cultural environment, against the aloofness of 'ideal' Enlightenment systems of thought. At the same time collection management rightfully has developed into a profession at its own right, based on rational schemes to guard the objects as long as possible for future generations. However, this aim of keeping as long as possible should never become the only aim of museums. Museums and collections exist to play a role in society. Keeping the collections isolated from the external world, only to be seen by curators, scholars and collections managers runs contrary to what a museum should be, and also contrary to the historical reality of the early nineteenth century roots of many European museums.

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Contact

Dr Pieter ter Keurs
Professor, Head of Collections and Research
National Museum of Antiquities, Leiden
Address: Postbus 11114 - 2301 EC Leiden, The Netherlands
E-mail: p.terkeurs(at)rmo.nl

Is research and teaching a key for preserving university collections and museums?

SÉBASTIEN SOUBIRAN

Abstract

It is now well known that one of the main challenges for university collections is the recognition of the usefulness of their heritage value within the institution. As long as university collections are used for research and teaching the danger of their “disappearance” is less acute. However, how to maintain this link when scientific activity is characterized by a strong turn over regarding subject of interest, practices, teaching and research tools? When internet and communication technologies open a new era based on the immaterial and the virtual?

I would present in my paper an overview of the various answers that have been put in place within the University of Strasbourg to maintain or give new value for teaching or research activities to our collections in different fields like Egyptology, ethnology, physics, zoology, botany, palaeontology, anatomy or history of science. A particular attention would also be put on the compatibility of research and teaching missions with, on the one hand, the long term preservation of the collections and, on the other hand, the accessibility to general public. In other words, to what extent is it possible to reconcile research and teaching activities with university heritage preservation?

The role of collections and museums as ‘tools/resources/elements’ for teaching and research is of major interest for several reasons. Firstly because university collections and museums are primary knowledge artifacts. Secondly because research and teaching have been the main activities of universities since at least the late 19th century. Thirdly, because this genuine link makes university collections and museum on the one hand precious and unique and on the other hand fragile, vulnerable and short-lived compared to cultural collections and other museum institutions. And last but not least, because most of the people in charge of university collections are academics or are managed by academics. In my paper I would like to address various questions: is the preservation of collections for the purposes of research and teaching an issue to be discussed or simply a matter of fact? Are teaching and research the only justifications for maintaining scientific collections? Do we only preserve them through constant use as teaching or research tools? Based on various examples in my own university, my viewpoint is obviously not only framed by many national specificities but also by the fact that a majority of our collections are collections related to ‘hard’ science. The University of Strasbourg does not have art collections.

An historical overview of the collections of the University of Strasbourg

Building knowledge and prestige

Like many European universities (LOURENÇO 2005), the University of Strasbourg owns numerous collections: zoology, mineralogy, anatomy, Egyptology, archaeology, ethnology, a herbarium, botany, paleontology, to name only the biggest. These collections are irremediably linked to the particular history of the university. The mineralogical and zoological collections have their origins in the natural history cabinet built by the Strasbourg naturalist, Jean Hermann, between 1762 and 1800 (WANDHAMMER 2008). Hermann also contributed to the rapidly expanding botanical garden which dates from 1619 (RUSQUE 2002).

The story of these collections, and the places where they are still sheltered today is, however, deeply marked by the more recent past with the installation of the Kaiser-Wilhelms-Universität Straßburg between 1872 and 1919, when the Germans annexed Alsace-Moselle after the French defeat in 1871. The Chancellor Bismarck obtained from the Reichstag both the statute of imperial territory

(“Reichsland”) for this new land, directly administered by Berlin with Strasbourg as capital and authorization for the creation of a new university. The new university should not only permit the development of German culture and language in the new land but also serve as a showcase for the power and modernism of the newly unified Germany. The monumental university buildings, their equipment, their teaching and research collections, as well as the highly qualified professors who taught there, all bore testimony to the huge investment made by the German Empire. Humanities were assembled in the university palace both along the imperial axes and facing the palace of the Emperor Wilhelm. The astronomical observatory was – and still is – located at the axes’ and campus’ end (BOURA ET AL. 2009). It is surrounded by the new botanical garden with Victorian style greenhouses (the old garden was turned into a cemetery during the siege of Strasbourg). Between these were built the Botanical Institute, the Institute of Physics and the Institute of Chemistry (the biggest building). The collections of the natural history cabinet were distributed into two new museums integrated into the Zoology and Geology Institutes of the University. Other than the various institutes linked to medical science that were finally built next to the old hospital, the university buildings were built into an integrated campus (fig. 1).

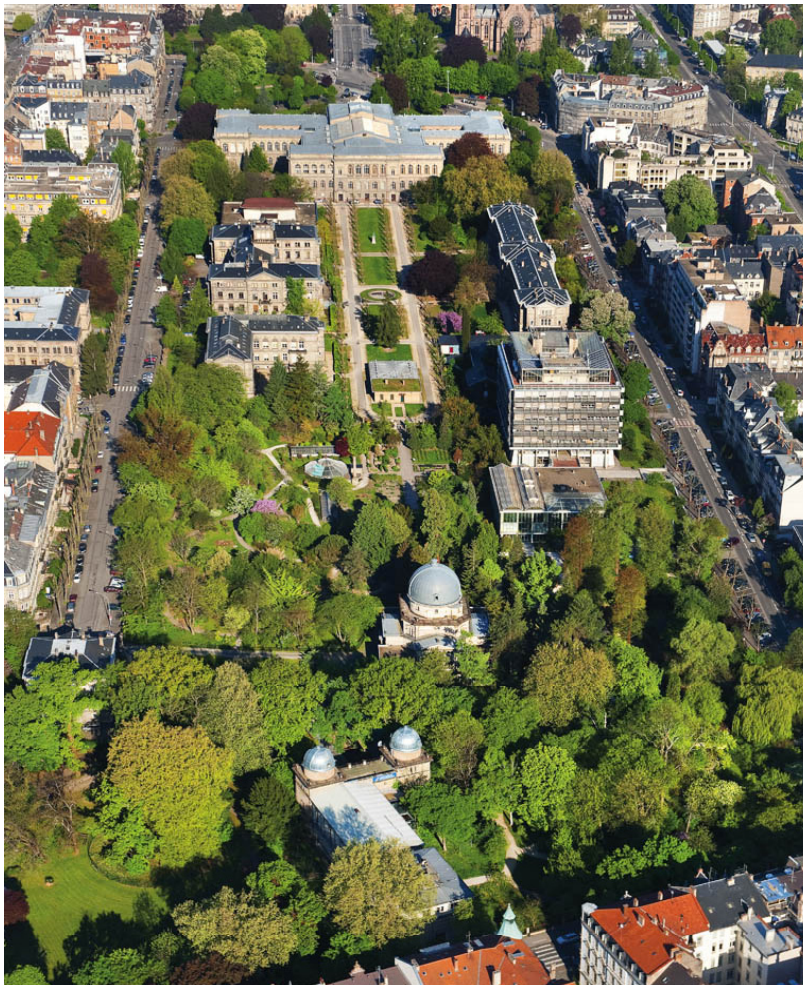


Fig. 1 - Historical Campus, Université de Strasbourg, Photo: F. Zvardon © Région Alsace, Inventaire général

When the French got the annexed territories back after the First World War, they were also keen on proving that they could do at least as well as, if not better, than the Germans. The university benefited also from greater attention from the state compared to other provincial French universities. The strong investments were pursued once again by the Germans during the Second World War and then again by the French after 1945. Thus in many fields, not only science but also humanities, Strasbourg had certainly risen to become one of the best universities of Europe during that time despite its small size as a city (CRAWFORD ET AL. 2005).

Great numbers, various forms, different management

The bombing of the two World Wars and the four changes of nation and political system,

had surprisingly little impact on the preservation of university collections and museums: sketches, samples, stuffed animals, the herbarium, seeds, instruments (small and big), teaching and research collections of all sorts, thousands of objects were preserved and for the most part still are preserved today. The museum of zoology and mineralogy as well as the botanical garden and the herbarium are

still there, open to the general public; plaster casts stoked in the basement of the university palace in case of bombing during the Second World War are mostly preserved but still in the basement; museum spaces were built within the astronomical observatory and a planetarium was added in the 1980s, the old seismology observatory was turned into a museum of seismology and earth magnetism in the middle of the 1990s, and few others collections are on display in their institute like those of normal anatomy, paleontology or instruments of physics.

Like many other universities, we are confronted by the great scale of the collections and above all their heterogeneity. This heterogeneity arises not only from the nature of the objects, but also from their use (public display, teaching, research), from the person in charge of it (professor or retired professor, curator, technician) and even from their accessibility to the public (from none to day to day bases). Keeping this heterogeneity in mind is certainly an important point if one has to put in place a general policy concerning collections.

Towards a general policy to preserve and increase access of collections

A big step has been taken in Strasbourg in 2006 when the Committee of University Collections and Museum was created. This committee is composed of all persons in charge of a collection. Its objectives are first to establish ongoing exchange among its members, secondly to encourage collaborations, and thirdly to promote reflection on the implementation of a general policy regarding preservation and accessibility of the collections. This committee doesn't have an executive power within the university but its existence should counteract the 'every collection for itself' phenomenon which links the survival of a collection to a particular individual. We have created a website,¹ organized collective activities during the *Museums' night* and the *European heritage days*, and produced different exhibitions. But the most important part is certainly the discussions and exchanges that take place during regular meetings, and which help to dispersed heterogeneity into collective complementarities among the members.

Together with this committee the *Jardin des Sciences* – Garden of Science –, sustains and develops a general policy for the preservation and the valorization of the collections and museums. More broadly, this university's department is in charge of the communication and the spread of scientific culture towards children, young adults and scholarly public and also towards a general public. To put it briefly, it assumes the double role of a science centre and a museum structure. Its activities are developed within the university but also function on a regional scale.

Thus for the past few years collections and museum seem to benefit from a new general interest regarding their preservation and accessibility within the University of Strasbourg even though on the field this improvement seems fragile and limited. This awareness follows a more European trend for university heritage that arose in the end of the 1990s (BOUDIA 2007; LOURENÇO 2005; FERRIOT & LOURENÇO 2004; SANZ & BERGAN 2002).

Research and teaching an original link dangerous to break

Breaking the link get the collections at risk

One can find many examples within universities to sustain the idea that collections started to be at risk when research or teaching practices attached to them stopped. I would like to present our most striking examples at Strasbourg.

The first one will be the collection of Egyptology. During the 1970s the last professor in charge of the chair of Egyptology retired. For various reasons, this position disappeared and left the collections

¹ collections.u-strasbg.fr/ (accessed September 10, 2010).

without any official 'keeper'. It also meant that these collections now occupied a valuable space that could be used by another for 'living' research. The existence of the department of archaeology certainly helped prevent the collections from being lost into oblivion, however it didn't prevent their successive relocation from one room to another, from one shelter to another. A couple of decades later, new opportunities made it possible to create a new position in Egyptology. This in turn resulted in the assignment of new rooms to stock the collection, linked to a library, a teaching room and a conservation workshop for the collection. Even some display cases were bought to exhibit a few objects. In ten years, the collections of Egyptology regained a new legitimacy supported by the research fame and activities of the professor and his assistant, and also the masters-level courses in Egyptology that utilize the collections (it is indeed the only diploma in France which can use university collections of such abundance). Important work was also done to strengthen the accessibility and the visibility of the collections with the creation of a database and various exhibitions.

What happened to Egyptology, is now happening to paleontology. The last professor of paleontology retired few years ago and its position was used for another discipline. The University decided to stop research into this scientific field. The retired professor is still very active and he is a member of the committee of collections and museum of the university. However the retention and preservation of the large collections of paleontology and petrography is now questioned. What is at issue is the scientific usefulness of these collections within the university during a period without any active research taking place and with pressures concerning the space that it occupies while other laboratories are short of space. In order to make decisions about the future of these collections, it was decided to create an international scientific committee, composed of eminent specialists in this field but also curators in order to evaluate both the scientific and museological value of the collections. Compared to what usually happens, i.e. the disappearance of a given collection without any attention being paid, the intervention of the *Jardin des Sciences* certainly meant that the future of these collections could be discussed beforehand so that the best possible solutions be considered. I am doubtful that the university will again create a position in paleontology, though that would be certainly the best solution to preserve and give access to the collections.

Thus with these two examples, one can see that active departmental research and teaching provides a strong support for the preservation of a collection. One can name briefly other examples, like the herbarium, which survives because of the decision to preserve a lecturer position - and assistants to take charge of it when the position was vacant. Many other French universities opted against keeping their herbaria, such as the University of Montpellier, despite possessing France's second largest herbarium after the one of the MNHN. The Montpellier herbarium is at risk now of being closed and its specimens lost.

Science studies may offer a 'second chance' to preserve collections

Collections of scientific instruments have a special status among university collections: some do not even consider them to be collections and others refer to them as 'second generation'. Second generation in this sense refers to their character as a medium and testimony of prior research activities and practices – in contrast to currently used research collections that are thus considered to be 'first generation'. But they do not only lack acceptance as collections, their preservation depends largely on the heritage value attributed to it by the same scientific community whose predecessors used these instruments.

In Strasbourg, some scientific instruments benefited from particular attention. Historical instruments of astronomy, seismology and earth magnetism are preserved and exhibited in museum spaces. In 2003, a preservation programme of instruments related to physics was created. In addition to instrumentation, special care has been given to the paper archives in order to bring together a set of

documentary data that shows the practices, knowledge, and research policies conducted in the fields of physics at Strasbourg University (SOUBIRAN 2007).

Among the various reasons that sustained this programme is the existence of a research group at the university dedicated to science studies and history of science, which has defined scientific heritage as a subject of its research activities. This research is based on the conviction that practices of memorialization, their motives and the aims they define, particularly within a university, cannot be separated from a historical or sociological point of view (BOUDIA ET AL. 2009). This close link enabled Strasbourg University to apply successfully for research funding to pursue research both on the history of physics in Strasbourg after 1945 and on scientific heritage practices.

Together with such usual research related activities as publications or the organization of workshops and conferences, this funding enabled the start of an inventory of scientific instruments within the university. This inventory uses the general inventory method in collaboration with the services of the regional Alsace inventory. This led to the creation of a database, in which each item receives a descriptive record, completed by documentary research. To date, more than 500 instruments have been inventoried, and more than 300 are already accessible online. This program will be extended to earth sciences, medicine, and physiology.²

Thus research activities in science studies and history of science certainly contribute to sustain several practical aspects of the preservation plan put in place in Strasbourg (BOUDIA 2002).

Collections may support new development of research and teaching

Research and teaching may support the creation and preservation of collections and vice-versa the existence of collections can support the development of new fields of research and new curricula.

It is now well known and proven that natural history collections find a second life linked to the development of new techniques and scientific interest on biodiversity and genetics. The old and dusty specimens that lots of universities were tempted to get rid of (or those less lucky, did throw away) are a unique opportunity for universities to participate to these new development of natural science. Though it might be too soon to analyze the change, however it seems that we currently face a new turn and that systematic sciences that were considered to be outdated practices compared to such new fields as molecular biology, may not in the end be that old fashioned.

Apart from the use of collections and museums in scientific curricula, new masters courses are opening this academic year in Strasbourg. The new curriculum is attached to the masters in science studies and would provide teaching on museum, science museum, scientific heritage, exhibition, cultural and museum policy. The main interesting point is the link between training in science studies and museum and cultural studies. It is quite an original connection in France where university science museum studies are more usually linked to information and communication departments. This curriculum is reinforced by the collaboration with two other masters of the university: the one on cultural policies (in political science) and of course the one of ethnology and museology. The opening of this new curriculum certainly relies on the development of the policy put in place five years ago on heritage preservation and cultural events that have been developed. It will also benefit from the various networks that have been built with museum professionals, heritage professionals, scientific culture professionals and historian of science.

It is also expected to offer new opportunities to start research studies on university collections, whether those in Strasbourg or on a more general point of view and helped to enhance their visibility

² www.hp-physique.org (accessed September 10, 2010).

as research object in various disciplines such as science studies, museum studies, cultural studies: master research or PhD thesis.³

Collections as pedagogical medium for training in science

If, as in many cases, collections are not used anymore for teaching in scientific field at the university, special actions were taken for the last five years to promote the use of university collections and museums for training in science not only for primary and secondary school pupils but also for their teachers.

In regard to primary schools, a special collaboration was started in 2006 with the regional university institute in charge of the training of teachers (IUFM), which is now part of the university. This program aims at building pedagogical tools for teaching science in primary schools using university collections and museums. Special visits of the university's museums are organized during the training of the future teachers, but also for those who are already in service. During the visit, different tools are offered to the teacher to prepare a class visit to the collections and the museums. An educational suitcase was also built with replicas of artifacts from various collections – stuffed animals, skeletons, a seed collection, a herbarium, and casts of fossils – for illustrative use in class room science courses.

The building of pedagogical tools is the result of a collaboration between animators of various structures of the *Jardin des Sciences*, professors in charge of the training of teachers but also teachers who have a special mission given by the regional authority of the Ministry of Education and devote from 3 to 6 hours per week to the *Jardin des Sciences*. In total, five teachers spend 20 hours per week working on the preparation of educational tools: some of them are directly linked to the collections and the museum structures of the university. These tools concern primary and also secondary schools.

The pedagogical use of the university collections appears more sustainable than their use for research but it may require finding a new public.

Counterexamples: Research and teaching doesn't necessarily preserve or guarantee the accessibility of collections

There are also quite a few examples in Strasbourg in which neither research nor teaching were able to guarantee the preservation of the collection or their accessibility to general public.

For instance, we might consider the collections of ethnology. These collections are connected to active departmental research and have courses that use the collections in teaching. Masters dissertations and PhD theses continue on a regular basis to be researched and written using the collections. However there is no proper room to store the collections of ethnology and they have repeatedly been moved from one place to another for the past ten years, so that today their accessibility is very limited. Apparently, the fact that research activities involve the collections – and in ethnology in general continue – or that master classes on ethnology and museology use the collections, hasn't really helped.

In Egyptology the strong use of the collections in research and teaching activity, limited the opportunity to broaden the accessibility to general public. Indeed, the department of Egyptology moved recently to a new building housing the research departments in humanities and social sciences. A special room was given to Egyptology, with special storage areas and arrangements to guarantee the accessibility and preservation of the objects of the collections. The room is also used for teaching. The new director's main interest is the use of the collection for teaching and research. He started the creation of

³ mastersts.u-strasbg.fr/ (accessed September 10, 2010).

a new database that includes not only archaeological artifacts, but also papers, archives and books related to the collections. This database is conceived primarily as a research tool to support scientific publications on the collection. Thus the collections are used primarily for academic activities. Exhibitions or public events are possible only on a limited scale.

These last examples certainly illustrate that often one needs more than a research and teaching program to save university collections or guarantee their accessibility to non academic public.

Recognizing a scientific and cultural value for university collections and museums

Is research and teaching a key for preserving university collections and museums?

Yes, if these objects created by and for academic practices should remain as such: namely scientific objects for the development of knowledge. Then we should also accept that their survival is strongly attached to the existence of the field that used and created them. One knows that objects of science, fields of interest, pedagogical tools, knowledge, change with time. Thus new collections continue to appear: for example, genetic code samples replaced stuffed animals (STRASSER 2007); 3D or MRI images, an anatomical specimen, a mineral, a fossil. The answer to this question also depends upon the scientific and political policy adopted by the university regarding which fields are of interest at a given time: paleontology still exists as a scientific field, as do botany and zoology – yet only in rather few universities. The new history of zoology collections may help to argue that the scientific value of a collection is never lost, what about mineralogy and paleontology specimens that have already been published? Collections comprised of research objects are like laboratory note-books, once the research is published they are of no use anymore. When you ask a scientist if he or she has any archives of his or her work, he/she first shows you off-prints. Collections related to humanities seem to have a longer lifetime than those of hard science. Humanities and social science may also become interested in the primary sources of science but these fields also have their own modes, own interests; it can't last forever. Lots of research on the history of science and techniques argues for the importance of materiality, objects, and practices of science but even they don't really need the material existence of the object in the end. After few publications, master or PhD thesis, the interests may decrease and the preservation for the advancement of knowledge may be less obvious. Pedagogical property of the collections appears more sustainable, but their use for teaching is also strongly linked to the existence of associated research within the university. Thus, why keep the object once the research is over, it has been digitized, complementary documentation gathered, and a full description made?

Has research and teaching helped the preservation of university collections and museum?

Yes again, most of the time, because above all, the primary missions of the university are research and teaching, so we should always create opportunities to maintain collections and museums in these activities, knowing that it always needs constant adjustments. However if this strong link is necessary in most cases, it is not sufficient if one is interested not only in the scientific value of the collections but also their cultural, historical and heritage value. The aim is different: on the one hand, it is the material use of the object that matters, and on the other hand it is its immaterial significance given by this different material uses. This immaterial value is reinforced by the sheer variety of what is in the collections and museum: stuffed animals, plaster casts, sketches, slides, maps, original or modified instruments, skeletons, seeds, botanical specimens, photographs, books ... This heterogeneity of the collections I mentioned at the beginning of my paper is a value in itself, because it testifies to the richness of the university as a knowledge and cultural institution. Very well, but while a university may have a museum, it is in itself not a museum! So this brings me to another fundamental question: Should the university itself be in charge of the preservation of its heritage and should it guarantee its accessibility to large public? Why can't this role be conferred to a public museum? Big museum

institutions are usually associated with high level research, teaching, preservation and accessibility of scientific collections. To name a few in France, the Louvre, the Beaubourg Centre, the National Museum of Natural History, the Conservatoire National des Arts et Métiers, and the newly created Musée du Quai Branly. Most of the collections preserved at the University of Strasbourg could certainly find their place in one of these museums. However the value of these collections is deeply bound to the University of Strasbourg and its high level scientific research, as well as the variety and quality of its education program. The collections and museums, whether attached to research and teaching or preserved for their patrimonial value, strongly contribute to define what is the university today.

Conclusion

The question is: How can the university assume this role of preservation?

Preservation of heritage goes hand in hand with accessibility. Teaching and research may provide access to collections for students and academics and as such any opportunities to encourage them is important to follow as already pointed. One has, however, to go outside the disciplinary framework with which each collection is associated. Their scientific and heritage value, as well as their visibility and accessibility would be enhanced if one considers them as mutual resources. University collections – because they are both knowledge and cultural artifacts – should be considered as fundamental material for research or teaching just like books and paper archives. In that sense collaboration with the university library is a serious option to follow. Although in the United States such collaboration is often undertaken, with a few examples also in the United Kingdom and Canada, in France the library and the museum are completely separate bodies. Within the university, collaboration between museum and library is certainly a serious path to enter. The policy of access for researchers and students developed by libraries can serve as guidelines: for instance links to web-based resources and collaborative digitization projects (GIBSON ET AL. 2007).

Moreover the myth of the Ivory Tower is no longer sustainable. A new regime of production of knowledge has been in place for the last thirty years (GIBBONS ET AL. 1994; NOWOTNY ET AL. 2001). In Europe, the building of a society of knowledge: put university in competition by creating a top university classification, encourage diversification of funding and stronger collaboration with private firms, a stronger role played by local authority (city, region), reinforcement of the links with civil society, implied new governance for universities to become – some would say – an enterprise. Concretely, the changes brought by this evolution of the university have had numerous impacts. One is the building or new assertion of a strong identity – in Strasbourg this process involved the fusion of three universities to one single University of Strasbourg. In many cases it translates into the development or the strengthening of the openness to the city and a particular attention, whether new or enhanced, towards identity building processes and their attached tools. Thus culture, history, heritage are thought as tools to be deployed in the building or re-arrangement of identity, which is often locally anchored.

North American universities, mostly built on an entrepreneurial system, offer the value of their experiences. However, to some extent this identity building goes hand in hand with prestige and a marketing dimension. One has to be watchful that a good equilibrium is preserved; the current financial crisis certainly shows the fragility of university collections if their marketing value becomes too dominant. Consequently, the cultural dimension of the university has to be taken more and more seriously giving university collections and museums a more fundamental and less secondary part to play within the university – not only as knowledge artifacts but also as heritage and cultural artifacts.

This is a new challenge to face, since the road will be a long and bumpy one if one wants to become attractive for new audiences, remain of use to researchers and students and fulfill the growing

expectations to create strengthen links with new partners. It is not just a question of becoming better but above all of being innovative in terms of museology. But aren't universities the place where new technologies are developed, where new knowledge on public, communication, cultural practices and policies are produced? Maybe it is time, on the one hand, not just to use this knowledge for ourselves but on the other hand, also to realise that taking care of collections, developing cultural events, and running a museum needs professional skills that are not necessarily innate or instilled through being an academic.

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Contact

Dr Sébastien Soubiran

Head of scientific heritage policy of the University of Strasbourg

Address: Jardin des Sciences, Université de Strasbourg

7, rue de l'Université, 67000 Strasbourg, France

E-mail: [s.soubiran\(at\)unistra.fr](mailto:s.soubiran(at)unistra.fr)

www.hp-physique.org; collections.u-strasbg.fr/

New perspectives and audiences for the university collections in Amsterdam

STEPH SCHOLTEN

Abstract

Major investments and organizational restructuring have led to important changes for the collections and museums of the University of Amsterdam, the Netherlands. These developments, which have resulted in a rather large centralized heritage organization within the university, are presented in this article. It will be argued that by pulling resources and by closer cooperation, smaller university museums and collections could reach better results more efficiently.

Introduction

In recent times, major investments by the university have led to important changes for the academic collections in Amsterdam, the Netherlands. This article will briefly go into the history of these collections, their current situation and the planned developments for the next few years. The recent developments have led to a situation that is radically different from the crisis that most university museums are experiencing. This Dutch example may point to a possible way out of the catch-22 situation that many university collections and museums seem to find themselves in: I will argue at the end of this article that the strong tendency to focus on what sets university museums apart from other museums, and why the specifics of individual collections and museums makes close cooperation impossible, may not be very fruitful. It could be argued that by pulling resources and closer cooperation, better and more efficient results could be reached. I will use the history and context for university museums in Amsterdam and in the Netherlands as a case in point.

A short history of the university collections in Amsterdam

The origins of the collections in Amsterdam lie in the far past, in the late middle ages, when convents and monasteries built up libraries in the city of Amsterdam. In 1578, Amsterdam became protestant and all book collections from these catholic institutions were confiscated and centralized in the first public library of the city. This library became an important factor in the foundation of what was then called the *Athenaeum Illustre*, the *Famous School* in 1632, as Amsterdam did not get the right to officially found a university until 1877. When this was finally allowed, it was first a municipal university for almost a century. Since 1971 it is, as all Dutch universities, financed by national government. The University of Amsterdam is described as a general research university with about 30,000 students and 5,000 employees. At this point in time, the university has buildings all over the city, but a large scale relocation plan is underway. This will concentrate the university on four concentrated areas or campuses in the city: one for medicine, one for the natural sciences, one for the humanities and one for the gamma-disciplines, including law and psychology. The humanities faculty is the only one that will remain downtown Amsterdam. The buildings of UvA Erfgoed (University of Amsterdam Heritage Collections) are on the outside edge of this complex and they will be the most visible university facility in the city for the general public.

The first university museum in Amsterdam that can be properly called a museum dates from 1928. It was housed in the attic of the very first building that was used for the *Athenaeum Illustre* in 1632: the so-called Agnieten chapel that itself dates back to 1470. As a university museum it was closed in 2003 and the collections merged with the Special Collections of the university library. Since 2003, no new presentation on the institutional history of the university has been developed. University history does

play a small role in the program for temporary exhibitions, but decisions have to be made about its role in the future.



Fig. 1 - The combined buildings of the University's Heritage Collections downtown Amsterdam. The Allard Pierson Museum to the left and the Special Collections buildings to the right © Bettina Neumann

The Allard Pierson Museum opened its doors on its present location in 1976 after having been elsewhere in the city since 1934. In 2009 it celebrates its 75th anniversary. Although the museum has renovated some of its permanent exhibitions over the years, other parts of the museum are still as they were designed in 1976. Even though they have held up remarkably well, a renovation is

long overdue. We have started planning this and in 2010 we should have a plan that we can use to raise the necessary funds.

University collections in the Netherlands

Before 1990 university museums in general were hidden deep beneath the horizon of public awareness and government policy, with very few exceptions. But starting in 1988, the Dutch had one of the largest conservation programs ever running. It was called the *Deltaplan for the preservation of cultural heritage*.¹ Literally hundreds of millions of euro's, then guilders, were poured into museums and archives, to catch up with existing backlogs in conservation and registration of collections. In 1993, this author became one of its project managers. The Deltaplan project worked as a catalyst for a group of universities that had already been busy for some time to gain recognition for the role they were playing in safeguarding important segments of the national heritage. This with the purpose to get more funding for these efforts that were – in the eyes of many in the academic world – not part of the core business of universities, which is of course education and science. Interestingly enough, the Dutch universities, then as much as now, usually presented their collections as regular cultural heritage and not specifically or exclusively as scientific resources. Apparently they felt and feel that their *unique selling point* lays not in the scientific, but in their general cultural value. Five universities, out of the ten that exist in the Netherlands, published a number of reports about the size, problems and costs of the heritage collections and historic buildings they were maintaining. These 5 universities called themselves the 'classic universities' and they are in fact the oldest in the country.²

The managers of the Deltaplan project wanted to verify the financial claims of the universities and ordered a thorough external audit. The results were published in a book that later became the manual

¹ For a review of the Deltaplan project, see: Instituut voor Onderzoek van Overheidsuitgaven, *Beheer en Behoud in de Delta, evaluatie Deltaplan voor het cultuurbehoud*, 2000 en *De betekenis van het Deltaplan voor het Cultuurbehoud voor de rijksmusea en de rijksge subsidieerde musea, gepercipieerde resultaten en bewustwording*, Zoetermeer, 2000.

² The universities of Amsterdam, Utrecht, Leiden, Groningen and Delft. The University of Leiden being the oldest, already founded in the second half of the 16th century.

for funding conservation projects for academic collections.³ It showed convincingly that the universities were indeed holding important collections that needed support and the government provided a sum of about 11 million euro's over an 8 year period. the universities chipped in about 15 million euro's themselves. This may seem extravagant to some, but it is important to realize that culture as well as education and science are very much a public affair in the Netherlands, with the vast majority of funds being provided by national, provincial or local government. Institutions such as museums and universities receive up to as much as 90% of their income from public sources. As we are working in a very prosperous country with a vested public interest in culture, there is – in relative and absolute terms – a lot of money available.

These inventories and projects had all kinds of effects at the universities. In Amsterdam, it convinced the board of the university to develop their heritage as an asset instead of a burden. They decide to use the history and the collections to promote the university as an interesting place to study and work. Another important spin off was the new cooperation between the Dutch universities both on a level of strategy as well as between curators and other professionals in university museums. It became possible to develop common collection policies that made e.g. the exchange of collections –formerly unthinkable- a serious possibility. The Stichting Academisch Erfgoed (Foundation for Academic Heritage) functions as the vehicle for this national cooperation between university museums and collections.⁴

University collections in Amsterdam

In Amsterdam, many collections were preserved under the aforementioned Deltaplan and new facilities were created for the Special Collections of the university library adjacent to the Allard Pierson Museum, the archaeological museum of the university. In May 2007 this new venue for academic collections opened its doors.⁵ In the beginning of 2009, the organization was restructured and all collections are now part of one new, cross-university organization: the Heritage Collections of the University of Amsterdam or, in short, UvA Heritage. It is positioned as a special department of the university library. The author of this article was appointed director 1st February 2009. Are all collections part of the new organization? No, two museums are out of scope. Firstly, the Zoological Museum Amsterdam, which will move to Leiden in 2010 to merge with other Dutch natural history collections into a national research centre for biodiversity. The 'public face' of the research centre will be the national natural history museum Naturalis.⁶ And secondly there is Museum Vrolik, basically a collection of anatomical specimens and medical instruments. The academic hospital which houses this small museum, is also home to a huge art collection that is displayed in all public spaces of their building.⁷ This art collection of 6,000 works is not used as a resource for research or education.

The collections of the newly formed UvA Heritage can be divided into four categories:

- Special collections from the university library
- Institutional history of the university
- History of science
- Archaeological collections in the Allard Pierson Museum

³ Adviesgroep RBK, Om het academisch erfgoed, Rapport, opgesteld in opdracht van de Staatssecretaris van OCenW, 2006.

⁴ www.academischerfgoed.nl (accessed December 20, 2009).

⁵ I realise that many in our field are interested in more detail about the merger of library collections and museum collections. This is however not the focus of this paper. I will gladly discuss this topic at a next UMAC conference and/or publish about this in the proceedings.

⁶ For developments concerning the creation of the new Centre for Biodiversity see: www.naturalis.nl/ncb (accessed December 20, 2009).

⁷ For information on Museum Vrolik, see: www.uba.uva.nl/musea/object.cfm?objectid=948507F6-DEEE-4346-8E2EC0D8FFC6024D (accessed December 20, 2009).

Most of the collections can be found in the combined buildings of UvA Erfgoed, downtown Amsterdam, where the buildings occupy about 9,000 square meters of exhibition facilities, stores, study facilities etc. The Allard Pierson Museum has been at this location since 1976, in the former building of our national bank. In May 2007, the adjacent complex was opened for the Special Collections of the university library. There are also collections in the university library itself, which is a few hundred meters away, and in an outside storage facility on the Southern edge of the city. All in all, over 20 kilometers of shelves are used for storing the collections. Collections and objects can also be found at almost each and every university building. It is quite complicated to keep track of all these external collections, but I'll come back to that later. A special facility that we have is the so-called Artis Library, the library of the city zoo that used to also house the zoological department of the university. It is a 19th century library, of 1867 to be exact, in its original setting.



Fig. 2 - The Artis Library from 1867 © Bettina Neumann

All in all UvA Heritage has about 100 staff, permanent, temporary and voluntary, and there is a gross budget of about 7.5 million euro. This includes approximately 15% earned income, mostly for projects, such as exhibitions and digitization. UvA Heritage is a part of the university library, which defines its core business to act as a scientific information broker for all students and staff at the university. This sometimes causes friction, as some of our own library colleagues find what we do to be outside the scope of the library or – the other way around – we feel we are limited in our assignment to communicate with broader audiences outside ‘academia’.

The future of the university collections in Amsterdam

Up to now a lot of money was invested in UvA Heritage. The renovation and refurbishing of the special collections building alone cost almost 25 million euro. The motivation of the university board for this investment was the more or less general assumption that investing in the collections would enhance the

public image of the university. A thorough analysis of the costs and benefits, if possible, to prove that it was a wise decision, has not yet been made. To create focus, we are currently working on a policy paper to use for future development. Our mission statement has recently been reformulated as: “To

preserve the heritage collections of the University of Amsterdam and make them relevant for research and education, for a general audience and to contribute to the public image of the university.”

The four main long term goals are:

- We want to be an important facility for scientific work and therefore we aim for an active use of the collections for education and science, within and outside the UvA.
- We want to promote a sense of ownership of our collections and facilities for students and staff by encouraging active participation in exhibitions, events and other activities.
- We want to be an interesting and attractive heritage institution that reaches a substantial segment of our potential audiences within the university, in Amsterdam, within the Netherlands.
- We make a significant contribution to the public image of the university as an interesting place to work and study. We function as a showcase for the university and the scientific work of the university.

These general goals can be broken down into very concrete programs and projects. So, as an example, our goal “we want to be an important facility for scientific work and therefore we aim for an active use of the collections for education and science, within the UvA and for others”, can be followed up by the statement that “active use implies accessibility of collections”. Accessibility implies cataloguing, digitization, physical access, also for disabled, study and educational facilities, etc. For all of these we can and will make operational choices, such as “what to digitize for whom, in what way, at what speed and at what cost?”

In terms of priorities it is of course of foremost importance to ascertain continuity at a (financial) level that allows for proper programming of activities. There is always a limited amount of money left over once the rent and the staff have been paid and it is usually that last bit of money that allows for projects with the strongest impact: exhibitions, conservation, digitization, a new website and the like. However, these are usually the only flexible budgets there are and therefore the easiest ones to cut if budgets have to be cut.

To achieve financial stability, financiers and stakeholders need to be happy. In Amsterdam, there is basically only one really important party to look at: the board of the university who directly supplies funding. We will therefore, whatever happens, please the board. If they have visitors, we will receive them. If they want to have a party at our place, they are welcome (within the limits of our professional protocols of course!). We will go out of our way to make them happy. This implies for instance that they are always invited for any opening of an exhibition. They sit with the VIP’s that may be our guests and they get the floor if they want to get it.

Financial continuity also necessitates that funding is secured from other sources. This sometimes means that we do projects that may not be our highest priority. A good example is digitization. There are thousands of man years and millions of euros of work to do in our collections. We have collections that we think are of prime importance to digitize, but there may be no funding to do so. Other collections may be less important in our eyes, but are – for some reason or another – popular for private or public donors: we will not say no.

Continuity is also strongly supported if outside parties speak well of you to the board. So a strong focus on internal and external communication is necessary. After all, it is not enough to do good work, but it is necessary that relevant people know that you do good work. In Amsterdam, we try to involve key players from within the university. We e.g. have recently installed a ‘heritage advisory board’ of over 20 prominent scientists from the different faculties. They are high quality advisors for us and,

potentially, powerful advocates for us in the university community. We also always try to involve students and research staff in our projects or, in a recent example, we bring the collections to them.

In Amsterdam, as was mentioned earlier, the university is relocating campuses. In June 2009 the first phase of the new – huge – science faculty building has been finished. In February the faculty voiced that maybe, after all, it would be nice to do something with science collections. It was April when it was finally decided that it really was a good idea, which was of course too late to do anything properly. However, we felt it would be a great opportunity to show our potential and to impress the university community. Hard work went into it, but at the opening day there was a first exhibition that everybody was really enthusiastic about. It has gained us a lot of friends in a part of the university that was otherwise difficult to reach for us and we are now working on a follow up.



Fig. 3 - Part of the presentation of the science collections at the new science faculty
© Special Collections University of Amsterdam

The second thing that makes stakeholders happy is media presence. Television obviously has the greatest impact, but respectable newspapers and of course their science sections are also very important. In Amsterdam, we have appointed professional communications staff to achieve this. One always needs a bit of luck to be successful, but in general the media are happy to report about almost anything. That is, if you give them

interesting material. In planning our projects, we do consider the media potential and the way that activities will strengthen our profile for our different target groups.

We have defined two specific projects that are vital importance for our future. One is the collections policy plan. It is meant to give focus, to prioritize what is more important than the rest. It is necessary to decide where to invest, where to acquire, where to critically select, where to conserve, where to let go. We cannot maintain that everything is important and avoid choices. If we don't make well founded and critical decisions ourselves, others will make them for us, by cutting funding, by donating their money or collections to other institutions instead of to us or time will make selections for us. Writing up this plan is a difficult process that takes a lot of time and that involves almost all of our staff, but it is worth it. It provides an essential building block in our institutional policy and strategy.

Second vital project is the renewal of the Allard Pierson Museum. The museum also got a new director in 2009. Even though everybody was talking about the necessity for renovation in the near future, there was no plan and no money. This renewal is important for many reasons. First of all to become again an interesting museum for our target groups. Secondly because modern facilities are lacking in a number of areas and the installations need serious maintenance. It is also an opportunity to better

integrate the Special Collections and museum's facilities and potentially, it will lead to possibilities to show more of the collections in the areas of university history and the history of science.

Cooperation as an instrument for strategy and efficiency for university museums

So much for the situation in Amsterdam. At the UMAC conference 2009 in Berkeley, where I presented this paper, I was surprised to find a strong tendency amongst participants to focus on what sets university museums apart from other museums. The lack of understanding about this uniqueness – with administrators and the outside world at large – seems to be conceived as a major cause for the problems that many university museums and collections face. It also seems as if the uniqueness of individual collections and museums makes close cooperation between them impossible, even on a single campus or within a single university. To me that was surprising, even though I am not new to ICOM or to the museum community. But I am new to the UMAC committee and to the international specifics of university museums. This may be the reason why – up to now – I have always considered university museums to be first and foremost museums, like all others.

I would like to argue here that the focus on uniqueness and individuality may not be very fruitful. It must be noted that many university museums are very small, understaffed and underfunded. At the same time, the highly motivated professionals and volunteers that run these museums and collections try to offer a full range of activities to university staff and students, to local communities and to the general public. It could be argued that by pulling resources and closer cooperation better and more efficient results could be reached.

The history and context for university museums in the Netherlands, especially the situation in Amsterdam, may serve as a case in point. Of course, the Netherlands is a small country which makes cooperation, in practical terms, easier. And a single university, in a compact city such as Amsterdam, is a manageable entity. However, until recently there wasn't a lot of cooperation in the Netherlands either. And even on the small scale of the University of Amsterdam, it was inconceivable that faculties would allow a central facility such as UvA Heritage to guide and coordinate the historical or scientific collections. There was a much stronger focus on what sets thing apart than on what they have in common.

It is not necessarily a natural inclination of the Dutch to centralize what can also be done individually. However, we have learned that some challenges are better met as a group than as individuals, especially if the individual group members each have limited resources. This approach may take getting used to in places, such as in the United States, where competition is often promoted as the system to bring out excellence. This may be right, I am not arguing basic political philosophy, but it usually also means that besides winners there's collections that lose. And the winning museums do not necessarily keep the most important collections or have the most meaningful activities. It often means first and foremost that they're best at fundraising. It also means that understaffed and underfunded museums have to allocate precious time and resources to compete with their colleagues. It could be argued that if museums work together as a group e.g. in fundraising for shared purposes, they do not compete amongst themselves but only with other sectors. And because they share resources, they can afford a more professional level of fundraising which should lead to more success sooner or later. The same goes e.g. for outreach or educational activities. In many places all museums and academic collections are more or less reaching out to the same target groups in the same geographical areas with similar aims. It could again be argued that coordinating or pulling resources could raise efficiency.

The combination of a focus on uniqueness and individuality and a system of competition, may be exactly the reason why so many university museums and academic collections are underfunded and

understaffed and it may be asked what purpose is served in this way. During the conference, it was also argued that collections are best kept at the departments where they were formed. This is probably true in terms of the knowledge about and in that the use of collections is often related to the original field of science or institutional context where collections were formed. This does however not mean that the best level of organization is locally. In reality this organizational principle often means that for each of the different collections there is only one single specialist in the relevant branch of science responsible for keeping a collection. He or she has to do everything. In this way it is impossible or very difficult to organize necessary specialist knowledge such as on conservation, PR, fundraising, education etc. Again, the question should be asked what goals are achieved in this way. It is of course of vital importance that scientific knowledge about collections should be connected to them, but this doesn't mean that in terms of organization those knowledgeable scientists should bare the full load of museological responsibility. They are often not qualified to perform all museum tasks, which means that the care for the collections may be suboptimal.

It may seem easy to argue in this way given the budgets and staff numbers we have in our new heritage organization in Amsterdam. And yes, we are in a relatively luxury position. I am sure though that if all local and central costs as they were in the past are added together, it may show a budget that is not that far away from our current central budget for keeping the university's collections. And for that we get a far more professional level of collections care, of PR and marketing, of scientific and educational facilities, of exhibitions and events and a higher profile with our stakeholders. I dare not say if this would be the best approach for any given situation. I do know that it does work in The Netherlands and it does work in Amsterdam.

Contact

Steph Scholten, MA

Director Heritage Collections, University of Amsterdam

Address: P.O. Box 94436, 1090 GK Amsterdam, The Netherlands

E-mail: s.c.g.t.scholten@uva.nl

www.bijzonderecollecties.uva.nl

www.allardpiersonmuseum.nl

Building a collaborative network for the digital representation of engineering collections

SUSANA MEDINA, JOÃO PEDRO PÊGO, CÉLIA MACHADO, JOÃO CARLOS AIRES & JOÃO REBELO

Abstract

This paper charts a collaborative experience between university scholars and museum practitioners from two faculties of the University of Porto (Engineering and Humanities). It is based on an historic experimental apparatus with great research potential: namely a single-component aerodynamics balance used to measure drag and lift in bodies. This object is included in the museum collection of the University of Porto's Faculty of Engineering.

The case study concerns a collaborative network built with internal contributions and resources from the two faculties to support the creation of a digital means of communication and teaching using 3D Blender. The team shared the belief that digital technologies offer new opportunities for the discovery, preservation, representation, communication and use of university museum exhibits.

From the university team members' perspective, the different goals, motivations and knowledge creation processes, and the implications for the needs of preservation are examined. Finally, factors contributing to the success of the experience and the obstacles that challenged the collaborative process are discussed.

Foreword

Many university collections emerged through the accumulation of objects that were no longer used in their original teaching or researching contexts. Many university museums originated from the need to preserve research and interpret these collections. Understanding the significance, the new meanings and roles of these collections, both to universities and to contemporary society, has informed changes in the definition of the university museum's mission.

Despite a recent awareness of public interest, many university collections still remain untouchable treasures. Particularly in the engineering field, better understanding of an instrument often requires manual, mechanical or electronic manipulation. As a static display, collections speak little about themselves and the roles they played in teaching and research within the academic community.

Understanding an object means gathering information about it, and documentary research processes embody scientific and technical concepts and use present and past knowledge. Collection research also aims at a better understanding of the connection of objects to concepts and disciplines, and this research and initiative on the part of the museum can often result in renewed scholarly and scientific interest in the collections. The pedagogic potential is rediscovered and access to collections for classroom use is reclaimed.

University museums are also increasingly asked to contribute more significantly to informal education programs as part of their public agenda. In balancing the demands and needs of the academic community and contemporary society, the museum of the Engineering Faculty at the University of Porto has been looking at the most effective ways of telling the stories behind the knowledge produced in Porto's academy.

Faculty of Engineering, University of Porto: Academic context and history

The first Portuguese School of Engineering was founded in Porto, at the Academia Politécnica, and it became the Faculty of Engineering of the University of Porto (FEUP) in 1926. FEUP inherited some of

the teaching and research collections of the mid-18th Century onwards, but records show that its collections have been reorganized, dispersed and, some of them, lost through administrative changes. In 2000, FEUP moved to a new campus situated in northeast Porto. The move from the former premises triggered an internal drive for the creation of a museum at FEUP. This was created in 2003 within the structure of the Documentation and Information Services (SDI) that also comprises other units such as the library, archive, information systems and publishing. Each of these units has a specific mission, resources and personnel, and through integrated work practices, the new creative technologies and the storage, dissemination and communication of information all play a relevant role. The information strategy of SDI is based upon the existence of a repository of digital objects coming from the various units' resources and activities. Within this strategy, SDI offers specific content types in its portal in order to support the information needs of the academic community and external users.

As a formal structure with trained curators, the museum's specific mission for FEUP's collections is to accommodate and study historical teaching and research collections; to create collections with objects that have lost context; to provide access to FEUP collections both to internal and external publics; and to appreciate their significance and potential to the FEUP community, the university and to society (FEUP 2008).

Nowadays, FEUP's heritage comprises 1,300 individual objects organized according to their provenance in teaching collections, by-products of research activity, equipment formerly used for teaching and research and academic memorabilia. The museum's collections remain inaccessible to the general public for a number of reasons. Nevertheless, public access to collections has been possible through exhibitions, publications and digital platforms, which are empowered through research team programs involving the museum staff, tutors, students and technicians from FEUP, as well as students on internship programs from the Porto University Humanities Faculty, all of whom are engaged in collaborative networks.

Building a collaborative network for the digital representation of engineering collections

Since its very beginning, several fortuitous coincidences steered this project towards a collaborative model. The staff of the museum was studying an aerodynamic balance from the aerodynamics collection, an apparatus that consists of a heavy base with vertical rod and adjustable boss on which the balance beam is mounted. Depending on the position the balance beam is mounted, it can be used to measure lift (fig. 1) or drag (fig. 2).¹

¹ An object moving through a gas or fluid (a car in air or a swimmer in water, for example) or an object around which a gas or fluid flows (like the pillar of a bridge or a skyscraper) experiences several forces bearing in different directions relative to motion. The two most important and easily recognised are drag and lift.

Drag is a force that opposes the relative motion of the object and gas or fluid and is integral to the resistance produced by the impact of gas or fluid particles on the surface of the moving object.

The correct measurement and prediction of drag is basic for many everyday applications: Knowing the drag a moving car experiences is necessary to choosing the correct engine; in order to beat records, swimmers use bodysuits that reduce drag; the construction of a skyscraper requires previous knowledge of the wind induced drag for the correct design of the supporting structure in terms of resistance and comfort (vibration of the building).

Drag depends on the velocity, size and shape of the object as well as the gas or fluid properties like density and viscosity, and is commonly presented in the form of the dimensionless drag coefficient C_D . This coefficient, which is scalable with the object size, is defined in equation (1)

$$C_D = \frac{F_D}{\frac{1}{2} \rho v^2 A}, \quad (1)$$

where F_D is the drag force, ρ is the fluid density, v is the object velocity and A is a reference area (normally the frontal area). The higher the value of the drag coefficient, the higher will be the object's resistance to motion. Streamlined objects like aeroplanes have small values of drag coefficients and thus are energetically efficient.

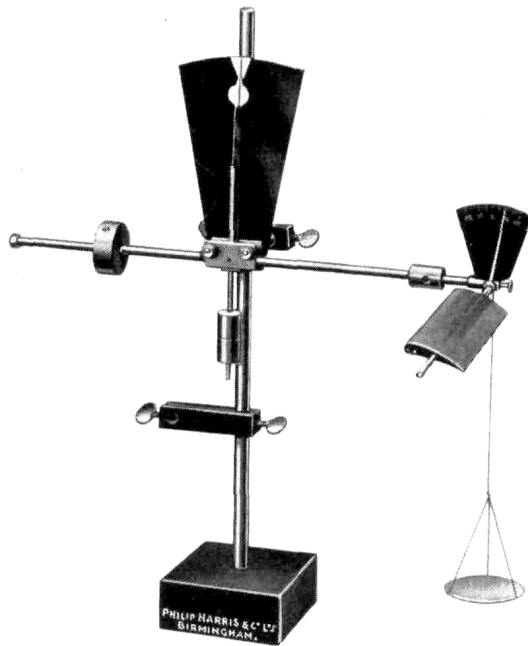


Fig. 1 - Aerodynamic balance fitted for lift measurements: the model facing the wind stream will experience a vertical force that will create a torque imbalance and lift the model. Placing weights on the balance pan until the pointer returns to the original position will balance the generated lift and give its measurement. (Image from a Philip Harris Limited catalogue.)

1. Wing model
2. Sliding weights
3. Zero position indicator
4. Angle of incidence scale
5. Scale pan
6. Heavy base

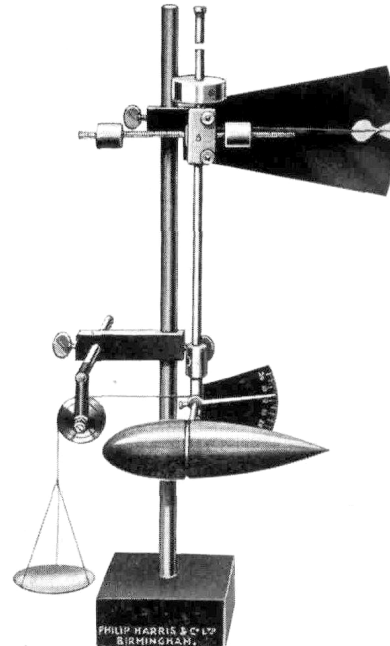


Fig. 2 - Aerodynamic balance fitted for drag measurements: the model facing the wind stream will suffer a force in the direction of motion of the wind that will be balanced by the weights in the balance pan attached to its support. (Image from a Philip Harris Limited catalogue.)

1. Streamlined model
2. Sliding weights
3. Zero position pointer
4. Angle of incidence
5. Scale pan
6. Heavy base

The materials and construction of the aerodynamic balance suggest it was built in the first half of the twentieth century (possibly the late 1930s). A catalogue provided by the manufacturer (Philip Harris Limited, Birmingham) from the 1950s includes this object. FEUP archive documents refer to its acquisition in the 1950s.

The construction of the aerodynamic balance suggests that it was used for demonstration purposes rather than for measurements in scientific experiments. The available study objects (streamlined body, sphere) support this idea since these are classic examples of fluid mechanics bodies. Until the 1970s, students could visualize certain aerodynamic concepts and acquire the knowledge that they would later use in their professional practice. In class, the aerodynamic balance could be used to explain the effect of drag, the influence of velocity, body shape and angle of incidence (angle between the direction of the flow and the axis of the body) in drag value. The balance was positioned in front of a small wind tunnel, with the object of study aligned with the inflow direction. Experiments like this were popular in engineering schools, since they provided direct student interaction with the problems to be solved. In recent decades, the use of this equipment in the classroom decreased due to acquisition

Lift is produced by some streamlined bodies with special shapes like aeroplane wings. It acts in a direction perpendicular to the relative motion between object and gas or fluid, and is the force that makes aeroplanes lift and remain airborne. The correct measurement of lift is also important as it defines how much weight can be sustained without falling.

and maintenance costs associated with mechanical models. The growing number of students in faculties also made demonstrations possible only for small tutorial classes.

The didactic potential of this apparatus and providing classroom access to it were the two main reasons that led to the creation of a digital representation. From the beginning, the physical preservation of the original object was a major concern: there were signs of deterioration such as deflections, scratches, corrosion, loss of bright metal surfaces and fine craquele coating. For this reason, the handling and use of the original object had to be done with care.

The first solution put forward by the research team was to create a replica, but it soon became evident that in the end it would be just a repetition of information. For the staff of the museum, there was also awareness of the multi-communication processes that surrounded this object, and the concepts, principles and ideas embodied in it.

“Besides its function of adequately transmitting information, the museum object is also a ‘thinking device’, a cultural tool for generating meaning. And the driving mechanism of generating meaning is the potential for a given object [...] to support multiple interpretations and activities” (ROWE 2002, 31).

The authors were looking for a medium to communicate the object in the most profound and accessible way and to represent the immaterial and meta-information associated with it. Creating a digital representation of the object in 3D format enabled the SDI digital information systems unit to surround this representation with a set of existing recorded contextual information. The potential of digital objects to become accessible to a diverse range of audiences, and the possibility to contribute to digital communities “across cultures, generations, and geographic boundaries” (FROST 2002, 86) were important factors to consider.

Apart from these qualities, two intrinsic characteristics of this apparatus, namely its aesthetic qualities and its mechanical properties, support the concept of a multimedia product. Finally, the use of collections in teaching and research environments is already common practice at FEUP: some items from FEUP’s Reuleaux Kinematical Collection have already been used in the last three years as study/project cases included in assignments for the Computer Aided Design and Manufacturing courses.

The project started in April 2009 and a temporary committee of experts was formed according to the specific needs of the research opportunity. Common principles of sharing and working together were agreed, as well as common operating rules and the responsibilities of each member:

- a museum curator, with competencies in museum studies and cultural planning, in charge of project design and management, and collection research;
- an assistant conservator, with competencies in conservation of cultural heritage, responsible for preventive and curative conservation;
- a masters student in museum studies, researching the aerodynamics’ collection;
- a professor of civil and environment engineering and researcher at FEUP, with specific competencies in hydraulics and fluid mechanics, responsible for the documentation of fluid mechanics collections;
- a multimedia developer at SDI – FEUP and masters student in multimedia at the same faculty, in charge of 3D modeling and animation.

The production workflow consisted of seven phases:

1. Inventory, preservation and research

a) selection, organization, description, assembling and preservation;

b) research on role of the object, origin and purpose, organization within collections (taxonomic, chronological), users, relationships and connections with other objects and the discipline in formal teaching and research contexts).

2. Analysis and documentation

- a) fluid mechanics analysis for modeling purposes, this was also important as a complement to the object research;
- b) definition and measurement of the components (fig. 3);
- c) assembling and alignment with wind tunnel;
- d) simulation for image capture (photo and video) as reference for modeling and animation processes.



Fig. 3 - Definition of the components

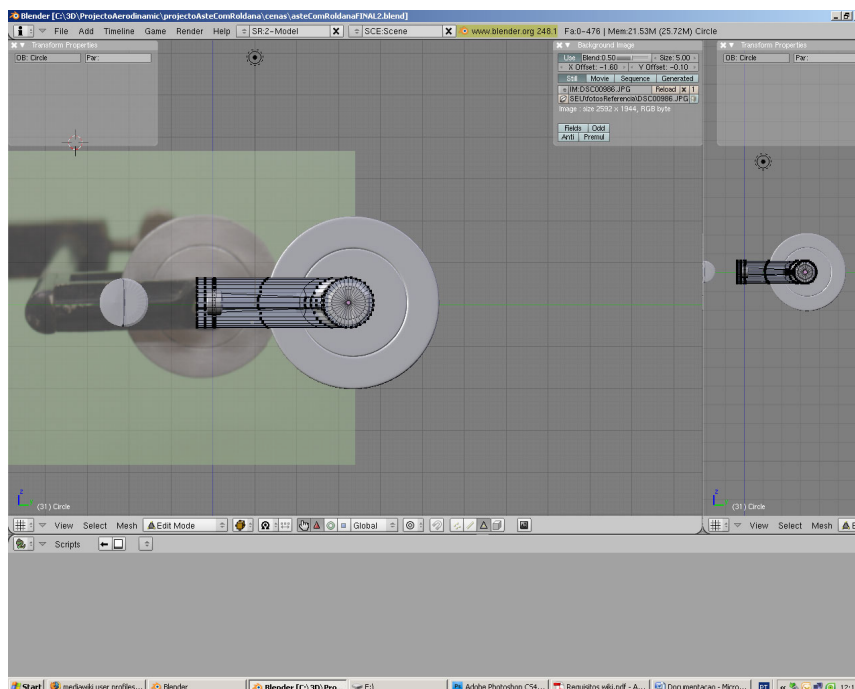


Fig. 4 - Subsurfing modelling of a component using 3D Blender

3. Modeling

- a) selection of 3D Blender as a versatile modeling software in terms of export formats compared to other 3D software packages;
- b) sub surfing modeling of every component using 3D Blender, individually (fig. 4);
- c) computational assembling of the components;
- d) rendering.

4. Rigging and setup for animation

- a) mechanical action-reaction dynamics;
- b) settling animation hierarchies.

5. Animation of the 3D digital model

- a) validation of the created animation;
- b) creation of appropriate key frames in the Blender timeline.

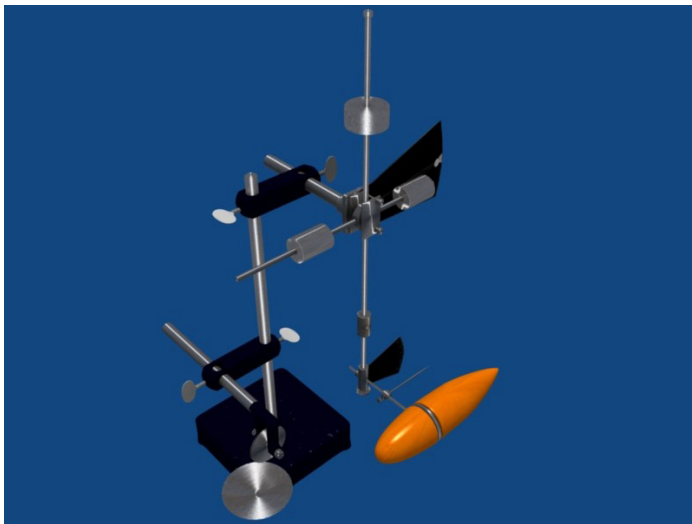


Fig. 5 - Production Pre-Render image

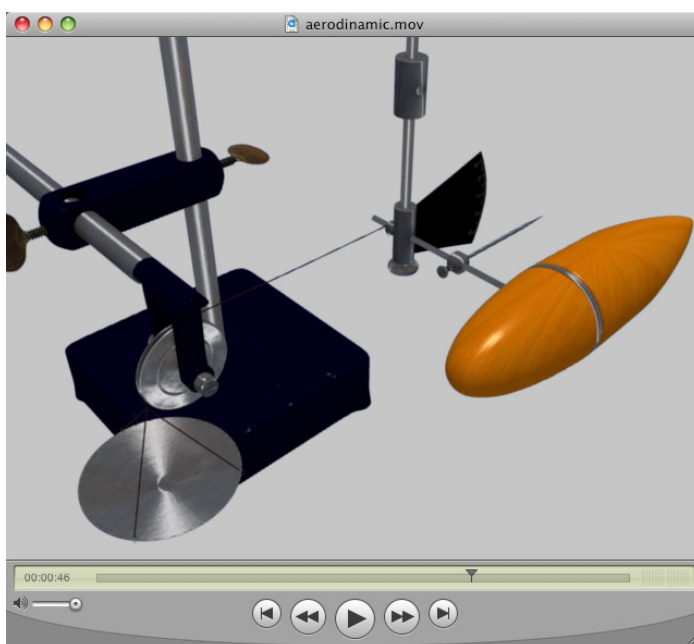


Fig. 6 - Screenshot from final animation rendering movie clip

6. Texturing

- a) identification of materials and detailed photos;
- b) creation of materials and textures in Blender, to insert in 3D modeled object.

7. Rendering

- a) definition of context uses – visual impact;
- b) application of the appropriate 3D rendering settings to produce a final animation with a high level of realism;
- c) animation export for video compositing.

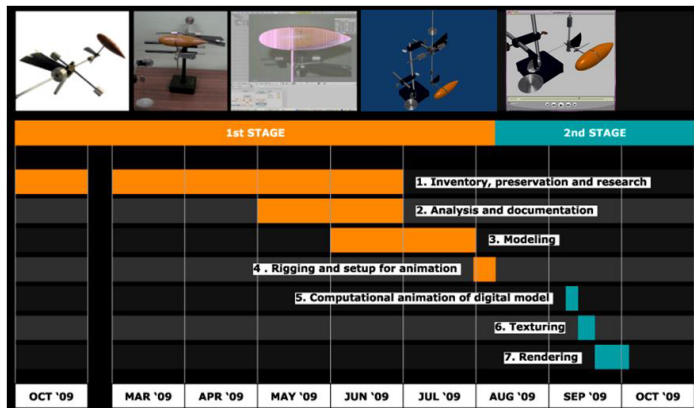


Fig. 7 - Project timeline

Further developments

The 3D model and animation will be stored and published in the SDI repository of digital objects arising from the various units' resources and activities. Contextual information to enable it to be used in different formats is also possible. A 3D model for classroom use, either as a pre-defined film or by allowing students to simulate experiments in a virtual wind tunnel will also be provided. A website describing the meaning and importance of lift and

drag measurement for many everyday applications, together with an explanation of the experiments, will be used to transmit this information to a wider public.

Main conclusions and remarks

Although these digital representations have not been submitted for public use and comment, there are some concluding remarks about the established network and working process as necessary conditions for starting a collaborative process to take into consideration.

These networks depend on resources, but first and foremost rely on a shared vision and an openness to new collection research methods. The success of the project was mainly due to a process based on the right partners with potential and ability (in terms of competencies and capacities), and other factors of a subjective nature such as trust, relevancy of the topic to every member of the team, effective involvement with the object and a shared institutional culture.

This interdisciplinary collaborative practice offered an opportunity for a broader and more profound knowledge of the object. The combination of technical and human approaches provided added value in the interpretation of the object. The project also allowed access to current and innovative knowledge produced in the departments of the university due to the participation of higher degree students and researchers.

However, some difficulties should be noted: projects like this are time consuming and costly in terms of effort and resources, and depend on academic timetables. Careful planning and a common collaborative infrastructure is needed.

In conclusion, the team members share the belief that the goals achieved would not have been possible if attempted individually. It is the authors' belief that the creation of a similar product through outsourcing would face a number of obstacles. On the one hand, there would be the need to create

more detailed guidelines in advance, and foreseeing all the details would be a difficult task for an experimental project such as this one. On the other hand, the time needed for the preparation of the guidelines could be incompatible with the current technological advances that the project required.

Acknowledgments

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Contact

Susana Medina, MA

Curator, Museum of the Faculty of Engineering of University of Porto

Address: Serviço de Documentação e Informação, Faculdade de Engenharia da Universidade do Porto, Rua Dr. Roberto Frias, s/n, 4200-465 Porto, Portugal

E-mail: [smedina\(at\)fe.up.pt](mailto:smedina(at)fe.up.pt)

biblioteca.fe.up.pt

João Carlos Aires

Multimedia Developer

Serviço de Documentação e Informação, Faculdade de Engenharia da Universidade do Porto, Portugal

E-mail: [jccas\(at\)fe.up.pt](mailto:jccas(at)fe.up.pt)

João Rebelo

Assistant Conservator

Serviço de Documentação e Informação, Faculdade de Engenharia da Universidade do Porto, Portugal

E-mail: [jrebelo\(at\)fe.up.pt](mailto:jrebelo(at)fe.up.pt)

Dr-Ing. João Pedro Pêgo

Assistant Professor

Secção de Hidráulica, Recursos Hídricos e Ambiente, Departamento de Engenharia Civil, Faculdade de Engenharia da Universidade do Porto, Portugal

E-mail: [jppego\(at\)fe.up.pt](mailto:jppego(at)fe.up.pt)

Célia Machado

Museum Studies Student

Curso de Especialização em Museologia, Faculdade de Letras da Universidade do Porto, Portugal

E-mail: [celiagodinhomachado\(at\)gmail.com](mailto:celiagodinhomachado(at)gmail.com)

Reaching out and reaching across: Collections and social inclusion

PHAEDRA LIVINGSTONE & JILL HARTZ

Abstract

This paper discusses the ongoing efforts of the Jordan Schnitzer Museum of Art, at the University of Oregon, to diversify itself and the publics it serves through programming, community outreach, institutional change and collection development. The JSMA has prioritized the building and sustaining of diverse publics in fulfillment of its new, more inclusive mission and in recognition of the growing and significant presence of Latin American and Asian/Asian American constituents in the region and state, including the university. With an Asian collection formed more than 75 years ago and given to the university to bridge cross-cultural understanding and create a more peaceful world, the JSMA is uniquely positioned to be a vital and relevant art museum for new generations of K-12 and university students and area residents. Increasing audience diversity and availing the collections for cross-curricular teaching, research and community outreach were embraced as key priorities in 2008-2009 strategic planning. Through acquisitions, cross-curricular teaching, research, advisory committees, and community outreach (key priorities in JSMA's strategic plan), the JSMA also furthers the university's diversity goals and seeks to build new audiences for the visual arts.

Introduction

The Jordan Schnitzer Museum of Art (JSMA) is one of two purpose-built museums on the campus of the University of Oregon (UO) in Eugene, Oregon. Starting in late 2008, with the arrival of a new Director (Jill Hartz), the JSMA has worked intensively on increasing its constituencies and their engagement. Strategies have included reaching out to various communities of the region, and reaching across campus to academic departments and students not yet taking advantage of the museum as an educational or cultural resource. The JSMA has also prepared for change internally, with long-range planning, evaluation, alliance building, program and collection development, and securing grant funding. These efforts are discussed further, following some details of the history and context of the museum.

Brief institutional history

The University of Oregon Museum of Art was founded to present the Murray Bass Warner Collection of more than 3,000 works of Asian art. The museum opened in 1933, and for most of its existence was under the direction of cross-appointed faculty, and closely affiliated with the art history department. Following a four-year closure for major renovations, from 2001 through 2004, the museum re-opened in 2005 as the Jordan Schnitzer Museum of Art, named after a major supporter of the renovation project. The project doubled the museum's size (to 70,000 square feet) and added state-of-the-art climate control, collection storage systems, public spaces, and new galleries. JSMA is now run as a publicly oriented academic museum and is a joint report of the provost/senior vice president and vice president of university relations.

JSMA holds significant collections of Asian, European and American art and is actively developing its Latin American holdings. The museum's Asian collection is regarded as one of the most significant on the West Coast and now numbers more than 8,500 Chinese, Japanese, Korean and South Asian works. It is one of very few university museums in the United States with Korean art galleries. These collections include both historical and contemporary works from both South and North Korea. The American and Pacific Northwest collection is comprised of more than 3,500 works in many media. The

growing European and Latin American collections include icons, paintings, prints, photographs and drawings.

The other UO campus museum, the Museum of Natural and Cultural History (MNCH), opened in 1936 and is still operated as a branch of the anthropology department. MNCH holds ethnographic collections from around the world, and large Native American and geological collections from Oregon. While the museums are of similar age and both recently underwent major facility renewal projects, they differ in their administration, approaches to curriculum and research, resources and public engagement. Despite sharing a host institution, the JSMA and MNCH have different resources and priorities, so would not necessarily approach the work described below in the same manner.

Local context

In 2008 the JSMA took on the task of diversifying itself and its audience. Locals and UO students were found to be under-utilizing the museum. Both the audience and the local population have been overwhelmingly 'white', but this is quickly changing. What some Oregonians may have until recently experienced as the illusion of a homogeneous population is being challenged as a result of new immigration trends. Some simple demographic data is offered here to illustrate only a few aspects of this rapid change.

Eugene, Oregon, is a city of 150,000, located 100 mi/ 160 km south of Portland. U.S. census data from the year 2000 (the most recent available) reports that twenty percent of the city's population is under 18 years old, and 12 percent is over 65. While there has always been ethnic and cultural diversity in Oregon, the state is still much more predominantly 'white' than the rest of the United States. Approximately ninety percent of the population is of European descent (U.S. CENSUS BUREAU 2009).

From the late nineteenth century through the 1960s, the vast majority of immigrants moving to Oregon came from European countries. Since the 1960s, European immigration has remained steady, but immigration has grown dramatically from Latin America, Asia and, more recently, Africa. By the year 2000, eighty percent of immigrants to Oregon arrived from countries outside of Europe, with more than half coming from Latin America. Oregon is also now one of the most welcoming states in the United States for refugee resettlement. Results for the 2010 U.S. Census will demonstrate the significant, rapid change underway.

Oregon now stands as a major gateway for new immigrants, which is helping to transform the state into a far more diverse and pluralistic society. Asians are the second largest immigrant group but (applying U.S. Census Bureau categories) are the largest non-white ethnicity represented on the UO campus. Most of Oregon's now approximately 379,000 Latino residents immigrated after 1990 and hail mainly from Mexico. By the year 2020, it is estimated that 28 percent of school-age children will be Latino. The JSMA serves as the art museum for the university, the local community and the region. School groups from a number of counties are served. JSMA, therefore, determined that reaching out to Asian and Latino communities was its first priority.

Planning

Increasing audience diversity and availing the collections for cross-curricular teaching, research and community outreach were embraced as key priorities in 2008–2009 strategic planning.

The strength and depth of the Asian collections afforded the museum strong ties with local Asian Americans but went unrecognized by the large number of Asian international students on campus. So, new programming was planned to attract these (and other) university students. While the Asian collection was already well established and shown in permanent collections galleries, the JSMA found

they had little material representing Latino culture. A commitment was made to build a Latin American collection.

As its new mission attests, the JSMA serves the university by strengthening its academic program, and it serves the larger community through educational and cultural outreach. Collections were already used extensively by some faculty for classes (some of which are open to community members), but many faculty seemed unaware of the potential art collections hold for cross-curricular teaching and research, beyond art and art history. Faculty receptions were held and exhibition proposal forms distributed.

The JSMA staff, university officials, faculty, students, and community members engaged in a wide-ranging self-assessment in preparation for AAM reaccreditation. As part of the self-assessment work, the JSMA long-range planning committee (including Hartz and Livingstone) reviewed the mission statements and best practice of 34 Pacific Northwest university museums, focusing on those with major art collections. This process began with a re-dedication, in the JSMA mission, to founder Gertrude Bass Warner's vision of why she collected Asian art and gave it to the university almost a century ago. She stated very clearly (in archived texts) that her collection was to be seen by the people of Oregon as an effective way of building cross-cultural understanding for the purpose of creating a more peaceful world. She said that art is one of the most potent tools in bringing people from disparate cultures together so they may gain a greater appreciation of other societies and countries and find a common language from which friendship, partnerships and peace might flourish. Never has this goal been more relevant at UO, where increasing numbers of Latin American students will soon take their degrees and where enrollment of students from Asia is strong and growing.

These ambitions matched well with a new Diversity Action Plan at the university, and both planning and grant support were secured. Grant funding was also obtained from the federal government. Focus groups were conducted with local leaders of Latin American organizations on- and off-campus to plan programs and marketing strategies.

Progress

Within a year, Hartz had made significant strides in affirming the JSMA's importance to the academic mission of the University of Oregon and its responsibility to the broader community, state, and region. The JSMA has a history of partnering with faculty, students, and community on Asian initiatives, but until this time did very little to engage Latino audiences.



Fig. 1 - Eugene Taiko performs at an opening reception for *On the Road: Two Visions of the Tokaido* © Jordan Schnitzer Museum of Art

During fall 2008, the JSMA presented a major Cuban avantgarde exhibition. A new initiative was launched for Spanish-speaking audiences that prioritized bilingualism in print, wall labels, audio tours, docent tours, in-service teacher training, and family days. Also, a private collector, whom the director had known from her previous position, gave the museum six major works by contemporary Cuban artists, and the JSMA was able to purchase a work by the noted Mexican photographer Tatiana Parceró; the JSMA was positioning itself

effectively to reflect Latin communities on a permanent basis. Relationships established with local community leaders have been maintained and, in the process, program committees have also been diversified.

Radio interviews were conducted in Spanish, faculty teaching Spanish language and Caribbean and Cuban history and culture were engaged, and the exhibition became a platform for coursework and community building. The opening reception brought hundreds of first-time visitors. For the first time, Spanish was heard throughout galleries.

The JSMA also continued to build its connections with Asian audiences. Japanese prints are often the first connection to Japanese art and culture – in fact, there are more Japanese woodblock prints in the U.S. than anywhere else. The spring/summer 2009 exhibition *On the Road: Two Visions of the Tokaido* compared Hiroshige's well-known edition of prints with that of a 20th century artist named Sekino. Information was presented in English, Spanish and Japanese. Throughout the summer, Japanese cultural presentations were held. Community members assisted in the production of two iTour podcasts, which were recorded in Spanish (🔊 [JSMA Tokaido Rd iTour Spanish](#) © Jordan Schnitzer Museum of Art) and in Japanese (🔊 [JSMA Tokaido iTour Japanese](#) © Jordan Schnitzer Museum of Art). The audio files here are excerpts of those podcasts. Cross-cultural connections were made through comparisons of traditional Japanese prints with work by contemporary American artists, like Iona Rozeal Brown, who layers hip hop culture onto ukiyo-e.



Fig. 2 - Chinese brush demonstrations in the Jordan Schnitzer Museum of Art studio © Jordan Schnitzer Museum of Art

The JSMA has also been successful in its strategy to build a diverse collection reflecting old and new constituencies by acquiring works from exhibitions. Works by Vietnamese American artist Binh Danh, who exhibited at the JSMA in 2009, were purchased. A local Cambodian group was also actively engaged with his show, which focused on the Cambodian genocide.

Conclusion

A range of strategies is being applied at the JSMA to engage an increasingly diverse public. The museum is taking advantage of existing strengths in the collections and is developing other collection areas through acquisitions and loans. Exhibitions apply cross-cultural themes, target marketing, and include multilingual texts, docents and iTours. The museum is consciously reaching out to campus and regional communities in the development of public programs, partnerships, and board recruitment. This work is being supported in part by internal and external grant programs for diversity initiatives. Staff and docent training also support this work.

JSMA now sees their task as two-fold: (1) to sustain the engagement of new audiences; and (2) to cross-pollinate them. For example, how can the JSMA create a dialogue *between* Latinos and Asian communities, using museum collections and programs regardless of whether they are specifically

Latino or Asian in focus? That is being explored in 2009–2010 through an American Association of Museums MAP Public Dimensions grant. As work-in-progress, JSMA continues to look for examples of best practice, and asks readers: What has worked for you in partnering with university departments or with other cultural organizations, in board development, in hiring and training staff or student volunteers and in making and sustaining new community relations?

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Contact

Dr Phaedra Livingstone
Assistant Professor, Museum Studies, Arts & Administration Program
Address: 1223 University of Oregon, Eugene, OR 97403-1223, USA
E-mail: [Phaedra\(at\)uoregon.edu](mailto:Phaedra(at)uoregon.edu)
jsma.uoregon.edu

Jill Hartz
Executive Director
Jordan Schnitzer Museum of Art
Address: 1223 University of Oregon, Eugene, OR 97403-1223, USA
E-mail: [hartz\(at\)uoregon.edu](mailto:hartz(at)uoregon.edu)

Creating metaculture: Community-based work with the University of Victoria's Williams Bequest

CAROLYN BUTLER PALMER

Abstract

The current use of the Michael Williams Collection at the University of Victoria provides a case study of a curating practice that develops and challenges Barbara Kirshenblatt-Gimblett's idea of metaculture. The collection itself may suggest the point of critical engagement for students developed by the teacher, who weaves in themes that are suggested by the history of that material. I will attempt to show my efforts to produce such a nexus through my recent efforts at working with the Williams bequest at the University of Victoria.

Introduction

The University of Victoria's Art Collection plays a significant role in shaping the university's identity both on campus and off. The director of the collection, Martin Segger, along with curator Caroline Riedel have enriched the university's reputation through the loan of pieces such as Emily Carr's *Happiness* (1939) for inclusion in art exhibitions at the National Gallery of Canada, the Musée des Beaux Arts, the Vancouver Art Gallery, and the Art Gallery of Greater Victoria.¹ Segger and Riedel have also woven pieces from the collection into the fabric of the university environment, as exemplified by the installation of sculptures in the campus's main quadrangle, the displays of prints and objects in administrative and educational buildings, and the presentation of exhibitions at the university's two main galleries – The Maltwood, located on the suburban campus, and the Legacy Gallery and Café situated in downtown Victoria.

Over the years, the art collection has served multiple agendas. It began in the 1950s, as a teaching collection for the institution's predecessor – Victoria College. Over the next fifty years, the collection grew in size from about 50 pieces to more than 27,000, through commissions, purchases, and gifts. In 1963, the university received by bequest the home and collection of English born sculptor and antiquarian Katharine Maltwood and her husband John. This formed the base of UVic's Western and Oriental arts collections. Today, the University Art Collection is composed of a number of minor collections that reflect specific themes, the biographies of artists, and gifts by major donors.

In addition to the increase in the number of pieces, the collection's function has broadened as well; in



Fig. 1 - Legacy Art Gallery and Café Exterior © University of Victoria

2001, the Department of Community Relations, which is within the Division of External Relations, took charge of the University Art Collection and galleries (SEGGER 2008, 54–55). According to the Department of Community Relations webpage, the University Art Collection and University Art Galleries currently have a mandate to support "UVic participation in community initiatives. These include sponsorships, program partner-ships and attendance at fundraising and charitable events."² In this regard, the University Art Collection and university galleries, and especially the downtown Legacy Gallery, now play an important role in the

¹ REIDEL, C. 2009. Exhibition history, email correspondence, Nov 12.

² University of Victoria External Relations, www.external.uvic.ca/community/ (accessed October 15, 2009).



Fig. 2 - Legacy Art Gallery and Café Interior © University of Victoria

Gallery (PETERSON 2002). As part of the largest donation ever received by this still rather young academic institution, the Williams Collection holds great significance, and is woven into the fabric of the university's academic identity. This relation is most concretely demonstrated by the fact that the most significant portion of the collection is furnishings used in academic ceremonies, commissioned by Williams specifically for university functions, including the Chancellor's chair, kneeling stool, mace stand, speaker's staff, and lectern (fig. 3). But the Williams Bequest also plays a significant outreach role, as is suggested by the fact that the university's President and Vice-chancellor, David Turpin, uses the Legacy Gallery to host breakfast meetings with city council members and other local interest groups.³



Fig. 3 - The Ceremonial Furniture Suite for The University of Victoria — Commissioned by Michael Williams, 1993 © University of Victoria

applied in practice. In short: my efforts build upon the tangible and intangible functions of the Williams Bequest.

development and stewardship of the university's patrons (fig. 1–2).

One donor collection of the particular importance for the university, and specifically of strategic importance, is The Michael Williams Bequest, a gift left to the university by the late Victoria businessman and developer, Michael Collard Williams, comprises about 1,000 pieces that was added to the art collection in 2001. The Williams Bequest is part of a 17.5 million dollar estate that included art, antiques, and a collection of downtown buildings, including one that houses the Legacy

The Williams Bequest also supports an academic position in the History in Art Department. In 2008, I joined the faculty as the Williams Legacy Chair in Modern and Contemporary Arts of the Pacific Northwest. My brief includes researching and curating objects in the Williams Bequest, developing a program of research that pays “special attention to engagement of the broader community”, as well as the interrelated pedagogic mission to use the collection “to develop experiential learning opportunities”.⁴ The emphasis on community-engaged research and teaching roughly parallels the agenda to support community initiatives of the Division of External Relations, yet the Williams Legacy Chair and its program are firmly rooted within the context of an academic department focused on the study of art history. This combined charge is unusual. The purpose of this paper, then, is to chart out a preliminary strategy that I have chosen for negotiating my role curating (i.e. taking care of) the Williams Collection. Below, I present a philosophical basis for my practices of community-engaged research, and teaching, followed by the philosophy

³ Legacy Gallery, Events Schedule, Legacy Gallery, 2009–2010.

⁴ University of Victoria's History in Art Department, *Endowed Chair in Modern and Contemporary Arts of the Pacific Northwest*, College Art Association, spring 2008.

Intangible heritage/metaculture

Museum studies scholar and anthropologist Barbara Kirshenblatt-Gimblett's 2004 essay *Intangible Heritage as Metacultural Production: Intangible Production*, examines the 'arbitrariness' and 'interrelatedness' of UNESCO's definitions of 'tangible', 'natural', and 'intangible heritage' and argues that institutionalization of heritage produces something new – what she refers to as 'metaculture'. Although she is focused on UNESCO's definitions, her analysis is a useful point of entry for thinking about the multiple institutional roles of the Williams Collection at the University of Victoria. In the following, I begin by summarizing some of the key points of Kirshenblatt-Gimblett's essay and then use them to help us better understand the Williams Collection in relation to multiple university objectives.

Kirshenblatt-Gimblett's essay begins with an overview of UNESCO's constructions of three types of heritage: tangible, natural, and intangible. 'Tangible heritage', she observes, consists of monuments or sites of "historical, aesthetic, archaeological, scientific, ethnological or anthropological value" (KIRSHENBLATT-GIMBLETT 2004, 52). As with tangible heritage, 'natural heritage' refers to remarkable sites, landscapes of scientific or aesthetic value, or "habitats of threatened plants or animal species and areas of value on scientific or aesthetic grounds or from the point of view of conservation" (KIRSHENBLATT-GIMBLETT 2004, 53). She goes on to observe that, over the years, UNESCO has come to acknowledge human impact on nature as part of 'natural heritage'. Unlike tangible heritage, natural heritage has a systemic orientation.

As the title of her paper suggests, Kirshenblatt-Gimblett is more concerned with the idea of 'intangible heritage', which has come to replace folklore as a heritage model. She notes that this shift corresponds to a movement away from supporting

"the work of scholars and institutions to document and preserve a record of disappearing traditions to one that seeks to sustain a living, if endangered tradition by supporting the conditions necessary for cultural reproduction. This means according value to the 'carriers' and transmitters of traditions, as well as to their habitus and habitat" (KIRSHENBLATT-GIMBLETT 2004, 55).

She then charts some of the ways in which definitions of the intangible overlaps with the tangible and with natural; the intangible and tangible are both considered to be culture, while the intangible and the natural are both holistic.

Although this shift was designed to overcome some of the problems embedded in the earlier folklore model, Kirshenblatt-Gimblett also finds the idea of intangible heritage itself problematic. These changes have produced the need for highly skilled workers, internationally agreed upon terminology, mechanisms for developing and implementing cultural policies such as preservation lists, archives and research centers – a series of institutions, including UNESCO; institutions that she collectively refers to as the 'heritage enterprise' (KIRSHENBLATT-GIMBLETT 2004, 55). For example, the very idea of intangible heritage is a product of the heritage enterprise: it does not preexist or exist outside of these institutional frameworks. In this regard, it is a form of 'metaculture' rather than heritage 'per se'.

Intangible properties of the Williams Collection

Despite the shortcoming that Kirshenblatt-Gimblett finds with the idea of intangible heritage, the utility it finds for the surrounding environment provides a useful context for relating the various roles the Williams Bequest plays at the University of Victoria. In this particular case, the intangible properties can be revealed through the supplement of a survey of some details of his life.

Michael Collard Williams was born in 1930 in Shropshire England and died seventy years later on a flight 'en route' from Victoria, British Columbia back to his motherland. Williams moved to Canada in



Fig. 4 - Williams Herding Sheep along Yates Street during a Victoria Day Parade © Photo: Bill Halkett



Fig. 5 - Swans Hotel at night © University of Victoria

1950. He first settled in central British Columbia and then to Vancouver Island in 1958. With little formal education, Williams first drew upon his training as a shepherd and opened a dog kennel in which he bred border collies in Langford, a community on the outskirts of the greater Victoria area. In the 1960s, Williams became a regular participant in local celebrations of Canada's official commemoration of the Queen's birthday, Victoria Day, by demonstrating his shepherding skills as part of the Victoria Day parade as it moved through the streets of downtown Victoria (fig. 4) (MCNENEY 2001).

Williams also helped shepherd the revitalization of Victoria's built environment. By the 1970s, Williams was one of several entrepreneurs who began redeveloping an area of Victoria known as Old Town. Williams renovated more than a dozen heritage buildings along lower Johnson Street as well as a 1950 Toronto Dominion Bank building on Broad Street, which is now the home of the Legacy Gallery and Café. At the heart of his revitalization program, Williams focused on renovating a granary built in 1913 into a hotel and brewpub that Williams christened *The Swans* to evoke Hans Christian Anderson's tale of transformation (fig. 5). Williams positioned his business as a boutique art hotel. His expanding art collection of contemporary Northwest Coast art was displayed through the hotel's public spaces and private rooms.

Williams was also passionate about improving the lives of Victoria's homeless community, and he engaged with artists who had an intimate acquaintance with the life ways of Victoria's indigent community. For example, in 1992 Michael Lewis, who worked in a homeless shelter, created an acrylic on canvas painting that depicts six members of an interracial group of homeless people known as The Apple Tree Gang. The Apple Tree Gang often gathered in an empty lot just a block away from Williams' Swans Hotel. In another piece also found in the Williams Collection, artist Ken Flett recorded the life ways of Victoria's homeless community in a series of monumental images that commemorate the lives of local individuals, such as his 1995 portrait of *Alistar Starbuck Reading From His Book of Revelations* (1995) and a portrait of *Vernon Jack* (1995), which depicts a member of The Apple Tree Gang. Moreover, he collected works by artists who were themselves insecurely housed, artists such as the eminent Norval Morrisseau.

Williams also tried to transform the lives of Victoria's homeless population and particularly members of The Apple Tree Gang with whom he had become friends and that included finding them shelter. During the winter of 1991, two members of the Apple Tree Gang died of exposure. The following November, Williams and a group of downtown businessmen financed and organized the installation of a prefabricated homeless shelter under the Blue Bridge in the waterfront area near Old Town. The shelter was made of glass and metal, had a gravel floor, and was heated by a wooden stove.

According to a 1992 *Victoria Times Colonist* report, Williams “wanted a place where chronic alcoholics could pass out – a more pleasant alternative to being hauled off to the drunk tank” (WILSON 1992). Williams then went on to liken the use of a structure for such purposes to a clean needle program. The structure ended up being used primarily by members of The Apple Tree Gang. Within three months of the shelter’s installation, a fire broke out, sending one man to hospital. Within days of the fire, the Coast Guard removed the structure for “safety reasons” and referred to the shelter as “a death trap” (LAVOIE 1993). Despite the shelter’s short lifespan, Williams remained dedicated to issues of homelessness until his own death nine years later in 2001.

As the above biographical account suggests, Williams was a businessman, and art collector who was dedicated to community projects that he thought would improve Victoria’s downtown environment. In these biographical details we discover what might not be entirely evident from a survey of the collection’s tangible properties alone: Williams’ personal concerns with urbanism and poverty – intangible properties from which we may construct a metaculture.

Building a practice of community engaged curating

How should the Williams Collection be utilized now that it belongs to the University of Victoria? During my first three years – a period that is half complete at the time of writing – I have chosen to approach the task by critically reflecting on the concerns about tangible, intangible, and metaculture as they relate the donor with urbanity and urban poverty. I attempt to present these concerns as they are reflected with the material provided within his collection, and use the Williams Collection as a point of entry for students to develop a critical curatorial process in relationship to the greater Victoria community.



Fig. 6 - *A Walk through the City: Experiencing Victoria as a Flâneur* exhibition poster © Photo: Kim Drabyk

During my first semester at the University of Victoria, I held a competition that invited my students to develop exhibition proposals based on Williams’ art collection, one of which would be realized in the spring of 2009 at the Legacy Gallery. My goals for the exhibition design seminar were not only to allow my students to create a sense of community among themselves, but to honor Michael Williams and the cultural intersections mapped by his collection as well. One of my students, Magdalyn Asimaskis, proposed an exhibit that tapped into Williams’ urban sensibilities by evoking Baudelaire’s idea of the ‘flâneur’ – an observer of urban life.

In the spring semester seminar we mounted an exhibit that developed Ms. Asimaskis’s proposal. The exhibit, called *A Walk through the City: Experiencing Victoria as Flâneur*, played upon contemporary urban sensibilities of downtown Victoria and the multisensory experiences that are available in the setting of a café gallery (fig. 6). Playing upon Beaudelaire’s concept of the ‘flâneur’, members of the class selected images from the Williams Collection that corresponded to urban

experiences of “people watching”, “anonymity”, “moving through the city”, and “ephemera”.

The exhibition was mounted in a small space behind the main gallery and coffee bar. Although this space is usually configured as a more conventional exhibition space without tables and chairs, we moved some of the cafe tables into the Legacy’s backroom gallery, inviting members of our audience to experience the sense of taste while viewing our installation of images. We also installed a CD player that provided a series of found sounds that members of the class had recorded on the streets of Victoria, including footsteps, buskers, busses, seagulls, and voices. The exhibit did not end at the

gallery's walls, but rather it spilled over into the streets of Victoria. Students plastered signs to the



Fig. 7 - *A Walk through the City: Experiencing Victoria as a Flâneur* street poster © Photo: Veronica Best



Fig. 8 - *A Walk through the City: Experiencing Victoria as a Flâneur* street poster © Photo: Veronica Best

street poles of Victoria that called attention to the exhibit and made provocative statements such as “Look Around You” and others that asked “Taking a Walk through the City?” and “Are You Aware?” (fig. 7–8).

I have conceived the second year's exhibit, *Regarding Wealth*, to build upon the work of the street-based theme of last year's *flâneur* project, adding the focus of local poverty.⁵ Given Williams' engagement with various facets of Victoria's urban poor, a focus upon homelessness as a cross-cultural condition is, I believe, a particularly apt one. Despite Williams' efforts more than a decade

ago, homelessness remains a concern in Victoria. In July 2009, Victoria's Mayor, Dean Fortin, who also co-chairs the Coalition to End Homelessness, set 2018 as the target date to house the 1,600 who are currently living without roofs over their heads.⁶ I do not expect an art exhibit to end homelessness, but by exhibiting the work of insecurely housed artists such as Norval Morriseau, and some lesser-known artists in the Williams Bequest Collection as well, I hope that we can contribute a picture, if only a partial view, of homeless people as creative people. At the same time, we honor the spirit of Michael Williams, and connect with the practice of a civically engaged art collector. Plans have also been laid for the 2010–2011 academic year to curate works of art from the University of Victoria's art collection at ACCESS health, a public health clinic in downtown Victoria that serves its homeless community. So, we have art specifically for, as well as from, the urban homeless presented in this scheme.

Conclusions: Creating metaculture

In this paper, I developed Kirshenblatt-Gimblett's argument that heritage preservation is an unattainable ideal and her idea that third-party engagement with heritage produces something new – metaculture. I have sketched a process of developing a metaculture within the museum studies environment that depends on critical engagement focused upon the tangible properties of the collection and the intangible properties of its collector; the Williams Bequest Collection developed out of Michael Williams concerns for urbanism and poverty. Building off of Williams' concerns and the material of the collection, I and my students have developed an exhibit concerning the urban ‘flâneur’ and are developing *Regarding Wealth* for the Legacy Gallery and an installation at ACCESS health

⁵ This project was much enriched by the comments and suggestions of students of HA 490/590/690 seminars of the 2008–2009 academic year: Eric Anderson, Magdalyn Asimaskis, Veronica Best, Heather Crowley, Melba Dalsin, Kim Drabek, Susan Hawkins, Mathew McKay, Andrea Porritt, Kaitlyn Patience, Mike Quan, Cassidy Richardson, Jysicca Richardson, Aleta Salmon, Nancy Schnarr, Julia Simpson, Filiz Tutuncu, Chang Won, and Christine Woychesko. As did the students from HA 583 and HA 493 of the 2009–2010 academic year: Magdalyn Asimaskis, Jennifer Cador, Sara Checkley, Gareth Clayton, Jamie Clifton, Heather Dixon, Laura Hayward, Julia Hulbert, Stephanie Korn, Katie Lemmon, Toby Lawrence, Elyse Longair, Kathleen Prince, Katy Scoones, Leah Taylor, and Holly Unsworth.

During the fall 2008 seminar, Susan Hawkins also explored the issue of homelessness with respect to the Williams Collection, though from a different perspective.

I owe a special thanks to my research assistant Tusa Shea for conducting some of the background research for *Regarding Wealth*.

⁶ City of Victoria. 2009. *Connect Newsletter*, Spring, 1.

that concern urban poverty. The collection and its cultural source, then, can provide clues to suggest points of fruitful critical engagement for curating and teaching. As Kirshenblatt-Gimblett suggests, in reality, as third party institutional actors we cannot truly preserve the intangible; instead, we can create metaculture. The multiple forms of community engagement with which The University of Victoria's Williams Bequest is bestowed (patronage, education, and research) indexes the reality that heritage, both its tangible and intangible properties, managed by institutions produces new entities – metacultures.

Acknowledgements

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Contact

Carolyn Butler Palmer
Williams Legacy Chair in Modern and Contemporary Arts of the Pacific Northwest
Address: University of Victoria, Department of the History in Art, P.O. Box 1700, Victoria B.C., Canada V8W 2Y2
E-mail: cbpalmer(at)uvic.ca

The educational values of the University of California Museum of Paleontology

SUSUMU TOMIYA, BRIAN A. SWARTZ & MARISKA BATAVIA

Abstract

The University of California Museum of Paleontology (UCMP) maintains the largest university museum fossil collection in the world and promotes research and education at its home, University of California, Berkeley, and far beyond. The museum supplies crucial materials and intellectual resources to a wide variety of university courses, where graduate and undergraduate students gain first-hand experiences in studying fossil specimens in laboratory exercises and class projects. Our specimen-based approach generates greater interest in the subjects and uniquely enhances students' understanding of biological diversity and evolution. Discovery-oriented class projects often pave the way for scientific publications in professional journals, which contribute to the research mission of the museum. For grades K-12, the museum offers hands-on learning experiences to the public through museum tours and outreach programs at local schools. Further, the highly successful UCMP website relies on the fossil collection to make educational resources in paleontology and evolutionary biology accessible to students of all ages around the world. The museum's fossil collection is vital to educational programs that disseminate paleontological knowledge and cultivate scientific literacy.

Introduction

Established in 1921, the University of California Museum of Paleontology (UCMP) is today the world's leading university museum of paleontology, with nearly three million specimens and more than 60 museum staff, faculty researchers, and graduate students actively engaged in its research and educational missions. From museum tours to partnerships with local schools and undergraduate courses in biology, a wide array of educational activities, both within and beyond the boundaries of the university, is made possible by this unparalleled resource (LIPPS 2004). In this paper, we discuss three recent examples of how the UCMP collection is being used to disseminate the most current knowledge of paleontology. We focus on hands-on learning for students of all ages because it is fundamental to cultivating the public understanding and appreciation of the discipline, and because this is where the museum collection plays a pivotal role in science education.

The utility of fossils in evolution education

Evolution of the Vertebrates is a semester-long lecture and laboratory introduction to vertebrate paleontology and evolution offered by the Department of Integrative Biology at the University of California, Berkeley (UC Berkeley). The class is open to undergraduate and graduate students, and employs specimen-based techniques and resources to cover the 500+ million-year history of vertebrates. The course draws entirely upon collections from the UCMP in its laboratory section to provide students with hands-on education. Museum specimens convey to students a suite of important evolutionary transformations, including the origin and early evolution of the skeleton, the origin of vertebrate life on land, the origins of reptiles and mammals, the evolution of birds from other dinosaurs, and how processes of fossil preservation bias the nature of the fossil record. In a time when creationist ideas are accepted as a viable alternative to evolution by an alarmingly high number of students and teachers alike (MOORE & COTNER 2009), the ability for students to see and touch evolutionarily meaningful specimens is an irreplaceable educational opportunity.

To help students understand how paleontologists take fossils from discovery, through preparation, to description and reconstruction, we use two specimens of *Tiktaalik roseae*, a 375-million-year-old fossil

that, in combination with several other well-known animals, bridges the vertebrate water-to-land

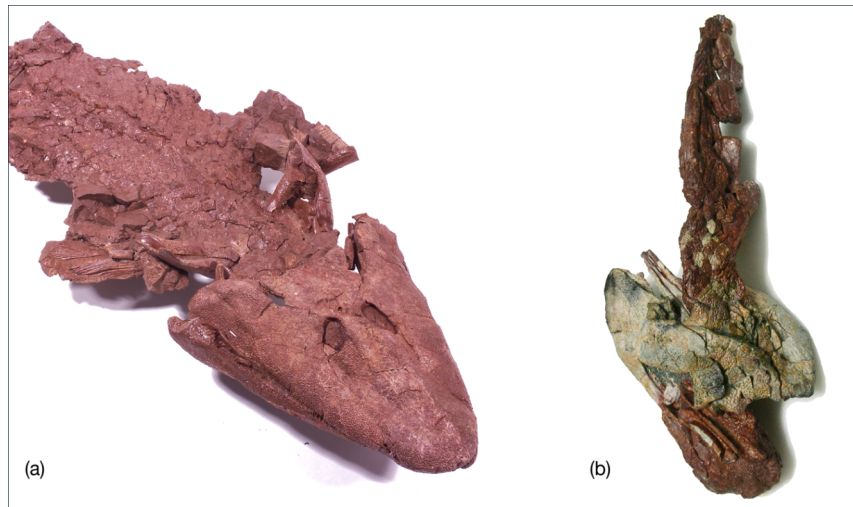


Fig. 1 - *Tiktaalik roseae*, a 375-million-year-old fossil 'precursor' of the first terrestrial vertebrates: (a) cast of the head and body; (b) cast of the right forelimb. See text for additional details.

transition. *Tiktaalik* shares many limb characteristics with both aquatic and terrestrial (i.e., land-living) vertebrates (fig. 1). By comparing two *Tiktaalik* specimens, and discerning the identity, articulations, and profile of their limb elements, students learn how to apply paleontological techniques to reconstruct the limbs of *Tiktaalik roseae*. Often in science courses, information flows from 'what is known' to 'how it came to

be that way'. However, by encouraging students to start without 'the answer' and work from smaller factual data sets to larger inferences, this exercise facilitates understanding of how unknown organisms are described, and how paleontological knowledge begins before elementary and descriptive data are integrated into the larger dynamic of macroevolutionary scenarios of history and change. This course integrates museum specimens at its core, and focuses on the utility of evidence in evolution and student inspiration at both graduate and undergraduate levels.

Course research project using museum specimens

Examination of specimens lies at the heart of traditional laboratory courses in zoology and geology with the main objectives of illustrating key concepts with concrete examples and fostering practical observational and identification skills. In *Morphology of the Vertebrate Skeleton*, another biology course at UC Berkeley, this approach is taken a step further by integrating museum specimens into a core research project.

In the fall semester of 2008, students undertook a project investigating the locomotor habits of the extinct saber-toothed cat (*Smilodon fatalis*) and the dire wolf (*Canis dirus*) by quantifying the shapes of limb bones of UCMP specimens. The pedagogic goals of this project were to (1) acquaint students with the history of the UCMP and the regional paleontology of California and (2) provide them with first-hand experience of specimen-based research in paleontology and vertebrate morphology. The choice of the study organisms was based on the fact that both are well known from the state of California¹ and are represented by more than 3,000 cataloged specimens in the UCMP collection. Furthermore, these specimens carry a significant piece of the museum's history, having been collected in the 1920s under the direction of John C. Merriam, a professor of paleontology whose leadership was instrumental to the early development of the paleontology program at UC Berkeley (LIPPS 2004). We think that the use of museum specimens with regional and historical connections to the university made the project more engaging for students, and promoted awareness of the museum as a public institution of science with relevance to its surrounding communities.

¹ *S. fatalis* is the official state fossil.



Fig. 2 - A student measures a specimen of the saber-toothed cat, *Smilodon fatalis*, to estimate its body mass.

For students, the most important aspect of this course project was the opportunity to conduct original research consisting of data collection, analysis, and the presentation of findings in written and oral reports (fig. 2). Specifically, students learned (1) the state of knowledge on the subject by reading and discussing the most recent journal articles, (2) how to take proper measurements of specimens, (3) how to analyze quantitative data with statistical software, and (4) how to make inferences about the functions of limb bones based on analysis of their shapes. The research culminated in two papers (one on the saber-toothed cat and the other on the dire wolf) that are potentially publishable in professional journals. In other words, the students not only learned how to conduct specimen-based research, but also actively generated new knowledge, contributing to the research mission of the UCMP. We suspect that similar, research-oriented course projects using museum specimens

are possible in many other academic fields in both the sciences and humanities.

Outreach efforts in San Francisco Bay Area K-12 public schools

The collection of the UCMP has been used for a variety of outreach efforts. First, in conjunction with a local non-profit educational organization called Community Resources for Science, a classroom lesson on fossils is periodically presented to second graders in different public schools throughout the cities of Berkeley and Oakland. The second-grade science curriculum in California covers fossils and the history of the earth, so this lesson complements the work that teachers and students are already doing in their classrooms. During the lesson, students learn what fossils are, how they form, and why paleontologists study them. By allowing students to touch and examine UCMP specimens, students remain focused, engaged, and enthusiastic about the material. This experience is particularly beneficial to students at schools where field trip funding has been reduced or eliminated, as it allows children to experience the excitement of studying fossils without ever leaving their classrooms.

A second outreach effort also compliments the second-grade state science curriculum. Local classrooms send Flat Stanleys – paper dolls named after the character in a popular children's book by Jeff Brown (1964) – to the UCMP, and graduate students in the museum photograph each Stanley with museum specimens of their choice, write a short narrative, and return the Stanleys to their home schools (fig. 3). Back in the classrooms, teachers recount the story of Stanley's adventure as a part of a lesson on paleontology, thus providing the students with a virtual fieldtrip to the museum. Teachers report that Flat Stanley is a valuable pedagogic tool, heightening students' interest in the subject and significantly enhancing their retention of the material.

Finally, specimens from the UCMP play an integral role in a summer program for socioeconomically disadvantaged high school students called Summer Math and Science Honors Academy, run by the

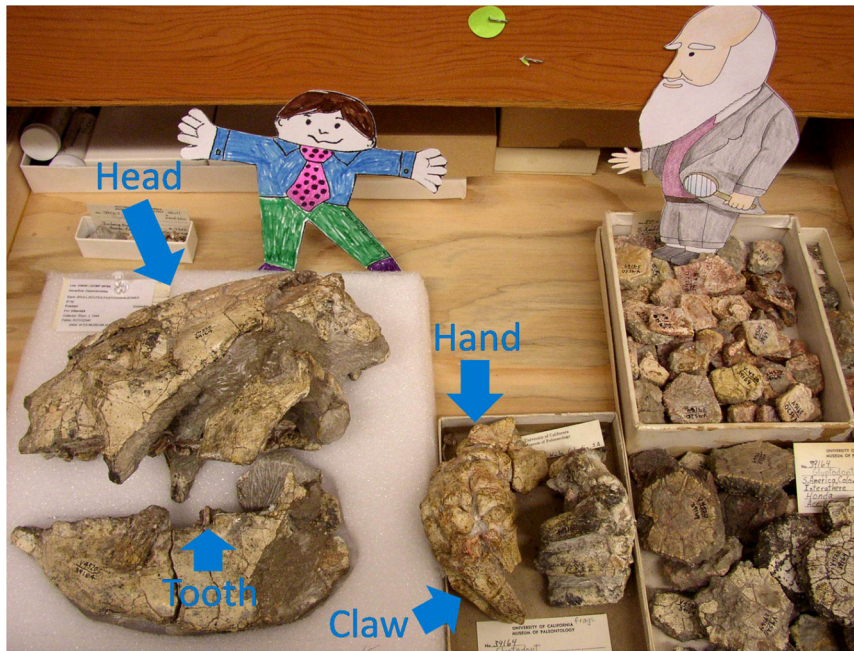


Fig. 3 - A 'Flat Stanley' from a local elementary school interacts with 'Flat Darwin' and several specimens from the UCMP. Pictured here are fossils of a glyptodont – a large, extinct relative of the modern-day armadillo. Stanley was returned to the students with several photos and a narrative about his visit to the UCMP, which were incorporated into the teacher's lesson on fossils and earth history. Photo: S. Tomiya

Level Playing Field Institute. Each summer, a small group of rising 10th graders work on a project to reconstruct the evolutionary relationships among several species of mammals. They observe and measure specimens from the UCMP's comparative skeletal collection, and use their data to determine how the mammals are related to each other. The use of specimens is essential for this activity, because photographs cannot capture the three-dimensional complexity of skeletal form. Moreover, access to specimens allows students to learn how to

ask and answer questions like scientists, how to collect and analyze data, and how to think critically about evolutionary problems.

Because the UCMP, like many other university museums, has limited exhibit space to display museum specimens, these outreach efforts are particularly important means of sharing the collection with the local community and building awareness of the museum and its missions.

Conclusion

We wish to note that the above examples illustrate only a small portion of the multi-faceted educational enterprise pursued by the UCMP – other successful programs sponsored by the museum include award-winning internet-based teaching and learning resources on the process of science² and evolutionary biology³. We hope to have illustrated the unique contribution of the university museum to the research and educational goals of the university, both as a powerhouse of new knowledge and as an institution of learning. With the realization that the understanding and appreciation of paleontology are crucially enhanced by personal contact with museum specimens and active involvement in the process of science, it is our conviction that the UCMP's collection will continue to play integral roles in science education.

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² *Understanding Science*: undsci.berkeley.edu (accessed September 7, 2009).

³ *Understanding Evolution*: evolution.berkeley.edu (accessed September 7, 2009).

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Contact

Susumu Tomiya

PhD Candidate

Address: University of California Museum of Paleontology, 1101 Valley Life Sciences Building,
Berkeley, CA 94720-4780, USA

E-mail: stomiya(at)berkeley.edu

Brian A. Swartz

PhD Candidate

E-mail: bobbitworm(at)berkeley.edu

Mariska Batavia

PhD Candidate

E-mail: mbatavia(at)berkeley.edu

The use of the Art Collection of the University of Porto in teaching and research

CLÁUDIA GARRADAS

Abstract

The Art Collection of the Faculty of Fine Arts of the University of Porto (FBAUP) mainly consists of works created in class by young artists during their learning and educational period. These works are collected primarily to provide a learning and teaching tool for fine arts students. In its formation and development, the collection has undergone significant changes.

Some of these changes were caused by the affiliation of the collection to the first public art museum in Portugal, the Museu Portuense de Pinturas e estampas, created in 1833. When the Academia Portuense de Belas Artes was founded in 1836, both the museum and the academy were placed under the responsibility of the same director. Additionally, the collection suffered from the effect of national education reforms to teaching and learning methods, which influenced students' art works and the development of the collection.

However, the original purpose of constituting the art collection remains the support of fine art education and training. Throughout the last decade, our strategy has focused on the co-ordination of museum activities with the teaching and research goals of the Faculty of Fine Arts in particular and of the university in general. It has also focused on its future role as a place dedicated to cultural and artistic knowledge more closely connected with society at large.

This paper concentrates on the teaching and research projects that have been developed since the official constitution of the Fine Arts Museum of the University of Porto in 1996.



Fig. 1 - Henrique Pousão (1859 – 1884), *Nude male model*, Charcoal on paper, 1881, 605 x 465 mm, FBAUP, Inv. 98.des.362, Photo: Jorge Coelho © FBAUP

Brief history

The Fine Arts Museum of the University of Porto officially acquired its designation and identity in 1996, following the integration of the Fine Arts School into the University of Porto. It has its origins in the first public art museum in Portugal, established in 1833. Its director perceived it, from the very beginning, as a living institution with a mission to educate artists and disseminate artistic taste. When the Academia Portuense de Belas Artes¹ was created in 1836, both museum and academy were placed in the same building, under the same director, and they shared a common destiny for almost a century. The museum was used especially by professors and students of the academy, but also by the general public.

The creation of a Fine Arts Academy, at the time offering training in drawing, painting, sculpture and architecture, led to the building of a collection of artistic objects, developed as a teaching collection. The best student works and works donated by teachers were also collected to be used as exemplars for students.

¹ Fine Arts Academy of Porto, later renamed Fine Arts School, and today Faculty of Fine Arts.

In 1932, an administrative reform separated the museum from the Fine Arts School. The museum, now upgraded to the category of 'national museum', was now under the state's direct responsibility. This administrative separation was followed by a physical separation (museum and school were installed in the buildings in which they remain today) and by a division of the art collection. The Fine Arts School mostly kept students' works, produced during their formative years, such as drawings, paintings and sculptures, and two excellent collections of prints (around 3,000 works) and old masters drawings (around 120), used as teaching instruments (fig. 1–3). From this collection, with this historical context and retaining its primary purpose of developing learning tools for fine arts students, the Fine Arts Museum of University of Porto project started in 1997.



Fig. 2 - José de Brito (1855 – 1946), *Nude female model*, Oil on canvas, e. 1886/ 87, 975 x 775 mm, FBAUP, Inv. 98.pint.150, Photo: João Lima © FBAUP



Fig. 3 - Carlos Marques (1948), *Nude female model* (teaching exam), Plaster, 1986, 131 x 53 x 38 cm, FBAUP, Inv. 99.esc.101, Photo: FBAUP © FBAUP

The museum's goals are:

- to provide access for the university community (teachers, students, researchers) and for the interested public, to a valuable heritage, consisting mainly of paintings, drawings, prints and sculptures, that illustrate and document the history of the fine arts teaching in Portugal;
- to provide an educational tool to be used by professors and students;
- to establish links with other museums and art collections;
- to develop links with the community at large.

The Fine Arts Museum's primary strategy was then to align these goals with the areas of study at the Faculty of Fine Arts – painting, sculpture and design. The first step was to engage each department in order to understand how the museum and its collection could be used best within undergraduate and graduate studies.

A regular program of activities was established: temporary exhibitions of works from the collection and current students' works; an annual exhibition by Erasmus students; MA final projects; workshops and

external exhibitions. In addition, both undergraduate and graduate curricular activities within today's three main areas of study – fine art, design and critical studies – often involve the collection for creative or research purposes.

This paper will explain some of the practical results of this strategy over the last decade.

A teaching tool

Undergraduate studies

The Department of Design was involved in the development of the museum website which was a student's final project in 1998. Its main features included access to selected works from the collection, information about the School's publications and a virtual exhibition room where students have the opportunity to present work specifically produced for that medium.



Fig. 4 - First year students, having classes at the museum, exhibition *The practice of drawing, in the Fine Art School Collection*, 2008, Photo: Cláudia Garradas © FBAUP

More recently, a technical upgrade involved not only the Design Department but also other schools of the University of Porto, namely, the School of Engineering and the School of Humanities. This upgrade resulted in three new important features: a tool to search the collection, a database to search for people connected to the collection, courses,

specific events, related to the School and to the museum's history, and information about ongoing projects.²

Another example of the use of the art collection in teaching programs is the exhibition *O Exercício do Desenho na Coleção da FBAUP* (*The practice of drawing in the Fine Art School Collection*). Editions of this exhibition are held once a year since 1999, in cooperation with the school's Department of Drawing. It displays around 50 selected drawings that cover the traditional drawing techniques – graphite, sanguine, charcoal and inks. Over a period of a month, together with their teachers, students have the opportunity to observe and discuss recent applications of those traditional techniques. This exhibition is now included in the first year of the undergraduate student's curriculum (fig. 4–5).

This exhibition represents also the first external initiative of the museum, as part of the strategic plan for community engagement. It was organized into four small touring exhibitions, displaying 25 drawings each, touring as part of primary and secondary educational programs.

The emergence of new fields of knowledge and the growing interest in interdisciplinarity has recently resulted in a collaborative project with the Department of Chemistry of the School of Science. Undergraduate students from both schools worked together on a contemporary art conservation project within the art collection. This project has already had some scientific output presented in international seminars in 2007 and 2009: in an international workshop on contemporary art

² museu.fba.up.pt (accessed November 22, 2010).



Fig. 5 - First year students, having classes at the museum, exhibition *The practice of drawing in the Fine Art School Collection*, 2007, Photo: Cláudia Garradas, © FBAUP

conservation methodologies in 2007 and in a one day seminar for young researchers of the University of Porto in 2009.

Graduate students

Graduate students are also involved in the museum's initiatives. Research as part of the MA program in museum and curatorial studies address issues related to the collection, within the fields of museology, curatorship and conservation. Students from other MA programs bring in additional contributions to the development of archival research, construction of digital tools or catalogue design.

Use of the collection in research projects

Research projects have been developed thanks to protocols established with public and private institutions, but also through post-graduate students and researchers. A result of one of those protocols is the publication of partial catalogues of the collection, such as the catalogue *Desenhos do Séc. XIX (19th Century drawings)*. Based on archival research into the drawing study programs in the earlier Fine Arts Academy, this shows highlights of the

different types of 19th century academic drawings: anatomy drawings; drawing from casts and live models, and composition.

The most recent publication is the result of a partnership with a commercial editor, to publish books about artists from the Porto School, students as well as teachers. The first, called *Landscape*, was published in 2007; a second and third book, dedicated to Eduardo Luiz (20th century) and Henrique Pousão (19th century), are about to be published.

The museum, along with the School's archive, is used by PhD students and independent researchers to find information about the formative period of the artists who studied in the School, about the Portuguese fine arts education system, and other related research subjects. This strategy has resulted in important contributions for the study of the art works and the artists of the collection, some of which are published in the museum newsletter, *Apontamentos (Notes)*.

Conclusion

Through the last decade, the Fine Arts Museum of the University of Porto, despite financial and spatial constraints, has reached an important position within the Fine Arts School and within the university. The definition of its areas of intervention, based on the strengths of the collection, as part of the school educational and scientific activities, has allowed the museum to consolidate its role as an instrument to support teaching and research.

At a time in which the University of Porto and European universities in general are undergoing major reforms, promoting interdisciplinarity and globalization of knowledge, university museums can significantly contribute to the construction of a university's identity. To be part of that construction, the Fine Arts Museum of University of Porto, urgently needs to:

- be integrated, along with all the other museums of the University of Porto, into the Portuguese network of museums, thus ensuring access to community funds;
- invest in building works, improve storage areas and ensure a permanent exhibition room.

This will allow the collection to acquire more contemporary artworks, produced by the students and teachers, some of whom are recognized Portuguese artists. It will also allow it to establish links with the community at large, increasing the collection visibility and relevance in the national artistic scene.

Meanwhile, the museum will continue, through its community and its most direct collaborators, the registration, preservation and study of the School's artistic heritage, as well as the promotion of cultural, educational and research programs.

Contact

Dr Cláudia Garradas

Curator and researcher at the Museu da Faculdade de Belas Artes da Universidade do Porto

Address: Avenida Rodrigues de Freitas, 265, 4049-021 Porto, Portugal

E-mail: [claudiagarradas\(at\)gmail.com](mailto:claudiagarradas(at)gmail.com)

museu.fba.up.pt

20:20 Hindsight. Retrofitting research relevance to the University Art Collections at Trinity College, Dublin

CATHERINE GILTRAP

Abstract

This paper considers the role of university art collections as meaningful contributors to the achievement of institutional goals relating to excellence in research, teaching and outreach. The discussion takes as its focus The University of Dublin, Trinity College, established in 1592, providing undergraduate and postgraduate courses in a wide range of disciplines. As practical fine art courses are not part of the teaching agenda, the university's art collections have evolved mainly as a historical narrative of the significant figures and achievements of its parent institution, parallel to the core business of research and teaching. While the other academic collections at the university, from anatomy to zoology, were generated by object based learning, it was only from 1959 onwards that the art collections were actively developed and exploited as a catalyst for informal learning and interdisciplinary engagement, driven by the actions of one man in particular, the late George W. P. Dawson, genetics professor. 20:20 hindsight – or the clearer perception of the significance of events after they have occurred – has been used as a guiding principle for the present renaissance of the utility of the art collections. The author, as curator of the Art Collections, has taken inspiration from the actions of George Dawson to prepare to retrofit formal systems of meaningful associations between the art collections and research and teaching. In an era that requires clear correlations between demands on funding and fulfilling campus-wide strategic objectives, university art collections such as at Trinity College Dublin are becoming more formally integrated into academic programmes as the useful educational and interpretive tools that many have been on standby to be for centuries.

Introduction

According to James Hamilton, “ceremonial, commemorative, decorative, and didactic” (HAMILTON 1995) are the four most common roles performed by university collections. However, while strictly academic collections have developed mainly for didactic purposes boasting close links with related academic departments, often art collections held by older universities display no clear point of origin or development path beyond the commemoration of poignant figures connected with the institution's history, usually amassed in an ad hoc manner by the occasional addition of portraits and receipt of donations. The initial stimulus to collect has not been driven by research and teaching, however with the increasing appearance of departments for the history of art and architecture from the 1960s onwards, this pattern began to change. In those institutions without faculties dedicated to practical visual arts practice, art collections perform the ceremonial, commemorative, and decorative roles, but tend to lack meaningful links to the university's core business of research and teaching. So, should, and can, this ‘didactic’ function be retrospectively applied to existing centuries-old university art collections?

Many commentators have argued that appreciation or pleasure should be the fundamental purpose of university art collections to which other roles are added – including Herbert Read's 1931 lecture on *The place of art in a university* published in his book *Education through art* of 1943, the Great Britain Standing Commission 1968 report on the relationship between universities and museums, and Sue-Anne Wallace's article on university museums in Australia published in 2000. Hamilton believes, however, that it is the added didactic purpose that differentiates university collections from the public sector and remarks that both processes help collections to be relevant and cared for. He states that,

for curators, “there may only be an inch between the ‘decorative’ and the ‘didactic’, but it is in that inch that we all live” (HAMILTON 1995).

Case study: The University of Dublin, Trinity College



Fig. 1 - The Senior Common Room, Trinity College, Dublin © The Board of Trinity College, Dublin

This paper focuses on a particular type of long-established university possessing art collections almost as old as the institution itself. The field of interest is restricted to universities offering courses in a variety of disciplines but where fine art practice is not on the curriculum, apart from the study of its historical development. In the case of Trinity College Dublin, the university was established in 1592 and its art collections date back to portraits and pictures commissioned or painted not long afterwards. There is no tradition of teaching fine art practice; however, in

1966 the Department of the History of Art and Architecture was founded, inspired by the pioneering cultural interests of the professor of genetics of the time, George Dawson. Indeed, he was also the founder of the modern art collection in 1959 by way of introducing a campus picture hire scheme that generated the active collection of art for the college beyond portrait commissions and passive receipt of donations. He could be considered as the first curator of the art collections or, perhaps a better description is ‘creator, collector, and catalyst’ of art and artistic activities at Trinity College – a phrase used as the title of a recent symposium at Princeton University (TILGHMAN 2006). However, the formal post of curator of the College Art Collections was only established in 2007, three years after George’s death. This is the first time the care of the art collections had been centralised and professionalised, previously cared for in an honorary capacity by various distinguished members of the academic and administrative staff. Five years before the inauguration of the curatorship, the College Art Collections Advisory Group to the Provost was set up, representing many disciplinary interests, and with which the curator now works.

While there had never been any formal integration of the art collections into the core business of research and teaching, George Dawson pioneered the active engagement of the campus, both students and staff, and the country beyond it, with the excitements and challenges of the evolution of modern and contemporary art. Having helped to found the university’s Department of Genetics in 1958, and inspired by George’s own experience of hiring artworks in Clare College, Cambridge, as a student of botany, he set up a similar system at Trinity College, Dublin. In fact, with George at the helm, the art collections grew rapidly as did the interest in the scheme. At a national level, he was involved in staging major exhibitions of international art, such as the *Rosc* exhibitions, and was on the board of the Arts Council, the Graphic Studio, and the Douglas Hyde Gallery. Furthermore, he encouraged many emerging artists to continue on their creative path by inspiring exhibitions of their work in different locations around the city and encouraging the purchase of their works.

For Trinity’s art hire scheme, known locally as *The College Gallery*, he persuaded the Calouste Gulbenkian Foundation to purchase and lend twenty-four artworks as the main body of the lending collection, and they later funded an exhibition space in the new Berkeley Library designed by Paul

Koralek and ABK architects of London. The Trinity College Dublin Association and Trust, supported by contributions from alumni, donated the first IR£ 100 that bought 27 pictures, mostly reproductions, which were also hired out each term. George wrote that “this reflected the serious educational intention of the scheme. Students, by having to change pictures each term, frequently had to explain their choices to their friends” (DAWSON 1980). He wanted to inspire interest in, and debate about, contemporary art at a time when there were very few Irish art galleries promoting it, this was thirty years before the Irish Museum of Modern Art would be established in 1991. He believed that by having to make a list of preferred artworks from the scheme, this compelled students to “look at paintings carefully, to discriminate and so to train their own taste and judgment” (IRISH TIMES 1961). The hire fees were fed back into the purchase of more works. George bought many artworks himself and lent a good deal to the College Gallery scheme, most of which were bequeathed to the college after he passed away in 2004.

One might wonder why Dawson donated so much of his time, money and artworks to college. He was a man who was generous of spirit and with his knowledge, believing that by offering opportunities to participate in visual culture beyond the boundaries of academic life, students in particular might expand their points of reference, meet peers outside their own disciplines and participate in the development of visual arts practice in Ireland. One such student who rented a painting early on in the scheme is now a senior lecturer in law and curator of the Art Collections at Athlone Institute of Technology, having established the collection himself in 1975, catalysed by George Dawson’s democratic art hire scheme (Catherine Giltrap, unpubl. data). Another law graduate who had been heavily involved in the student ‘College Gallery’ committee early on has described George’s welcoming character, during informal discussions with the curator, and how the students were encouraged to be involved in all aspects of the collections including visits to art exhibitions and purchasing artworks. He spoke of buying art on behalf of George for the collections, and how he had inspired him to purchase a series of William Scott prints with his twenty-first birthday money, stirring a lifelong interest in art. This alumnus also recalled meeting Sir Roland Penrose in the Provost’s house with George – Penrose being a great friend and biographer of Picasso and an artist himself, the link for the Picasso exhibition staged at the university in the 1960s.



Fig. 2 - The Smurfit Institute of Genetics, Trinity College Dublin, featuring artworks by Arnaldo Pomodoro © The Board of Trinity College, Dublin

From 1959 until 1967, there was no physical ‘College Gallery’ per se at Trinity, yet George enrolled this cross disciplinary committee of students to administer the hire scheme, acquire artworks, and set up exhibitions both on and off campus under his guidance. Students trained to stage exhibitions, develop a critical eye, and profited from an environment which encouraged experimentation and interaction. From 1967 onward, the newly built Berkeley Library incorporating a temporary exhibition hall, lobbied for by Dawson among others, played host to ten years of noteworthy exhibitions including a retrospective of Henry Moore’s sculpture with the assistance of the Arts Council of Ireland, and a major show of Pablo Picasso’s work while the artist was still living, organised by George and the student committee. Ireland, let alone, the campus audience, had never been afforded such opportunities. This practice of university galleries functioning like a laboratory or a work in progress promotes the much guarded uni-

versity principles of academic freedom and experimentation. In many instances, experimental or challenging art exhibitions have been hosted at universities decades before they were staged in the public sector museums. Examples include the A. E. Gallatin Gallery of Living Art, pre-dating New York's Museum of Modern Art, and hosted by New York University between 1927 and 1943 at a time when public museums were not interested in showing "fresh and individual works" (KELM 2004) by contemporary artists. At present, The Frame Gallery at the Carnegie Mellon University of Pittsburgh provides a locus for student art exhibitions and is run by students as a kind of training zone. In Ireland it seems that during the 1960s, '70s and even the up until the '90s, the university context, was a more welcoming location for what were still very challenging statements for Irish art institutions. Articles published during the 1960s in The Irish Times daily newspaper note the national significance of Dawson's promotion of contemporary Irish art in particular and that, increasingly, it was to this university that those interested in viewing significant Irish and international contemporary art should come.

In fact, George was set on changing the availability and accessibility of contemporary international art in Ireland, and, indirectly, to inspire a whole new generation of Irish art by pushing for the establishment of The Douglas Hyde Gallery at the university in 1978 – a more formal collaboration between the university and the Arts Council of Ireland. Until the early-1980s this was the epitome of a college gallery, prioritising student involvement and training, creating a programme that spoke both to the campus audience and the wider community. The outcome was the validation of student projects and a programme that enabled interaction with life beyond the campus and vice versa, a two-way bridge where campus and community engaged (MILLER 2008). However, unsustainable funding and governance issues generated the need for the Arts Council of Ireland to fully manage the gallery with Board input from George and the university, resulting in a significant contemporary Irish and international exhibition programme without which Irish visual arts practice would be much the poorer. The campus is now the sole focus of display for the college art collections. What may be perceived as a difficulty, is a great challenge, stimulating new ways to integrate art into the formal and informal learning systems and physical environment of the university.

20:20 Hindsight

The title of this paper refers to 20:20 hindsight, the act of looking back and learning from historical events or debates with the benefit of time and experience. As the first full-time curator of the amalgamated university art collections, while preparing to formally align the art collections with the university's strategic goals 20:20 hindsight allows me to recognise the incredible vision of a man easily described as an 'uomo universale', a Renaissance man, who moved in academic, political and international circles, having also established charities to benefit the Third World. George helped to encourage interdisciplinarity at Trinity College long before the term became familiar. While he may not have created a formal programme to highlight the utility of the art collections on campus, he went beyond this by inspiring interest in those who had no previous knowledge or involvement with art and, what is more, no faculty pressure to be involved.

The utility of the university art collections in Dublin have not yet been realised in relation to existing academic courses. However, the first two years of the curatorial post have been a preparation phase, creating an infrastructure that will form a foundation embedded deep into the academic and physical make-up of the college, above which a sound but retrospectively applied formal programme will be established relating the art collections to the teaching and research practices of a wide range of disciplines. The "ceremonial, commemorative, [and] decorative" (HAMILTON 1995) functions of the art collections at Trinity College, Dublin have long been recognised, but in an era when every university

sector that requires funding must justify its existence, it is time to demonstrate clearly the utility of the university art collections to the core mission of Trinity College Dublin.

Many commentators have highlighted paths to improving the relevance of university collections to the whole campus audience, one is to separate out the governance of the collections from academic faculty in order not to compete with academic funding and faculty politics. Secondly, it is advised that the purpose and value of the collections as resources for research and teaching should be incorporated into the institution's strategic plan. At Trinity College, the curator post is based within the Office for the Secretary to the College, enabling a truly pan-campus approach and affording access to advice and support from senior management. In 2008, the Vice Provost and Chief Academic Officer set about re-drafting the university's strategic plan. With the benefit of 20:20 hindsight having taken on board the advice of Tirrell and Ladkin given in 2001 and 2008, as curator I realised the urgency of integrating the significance of the art collections as a valuable resource for education and outreach, and was given the opportunity for involvement. In order that the collections be represented at the most fundamental level, that is as part of the core business of research and teaching, I became a member of the Strategic Planning Group considering the university's 'mission, values and vision'. The artistic and academic collections now feature in Trinity College's strategic plan 2009–14, their significant potential mentioned directly for the first time in the university's history. Furthermore, at a more focused level, the planned objectives for the art collections now reflect directly the core concerns of the parent institution.

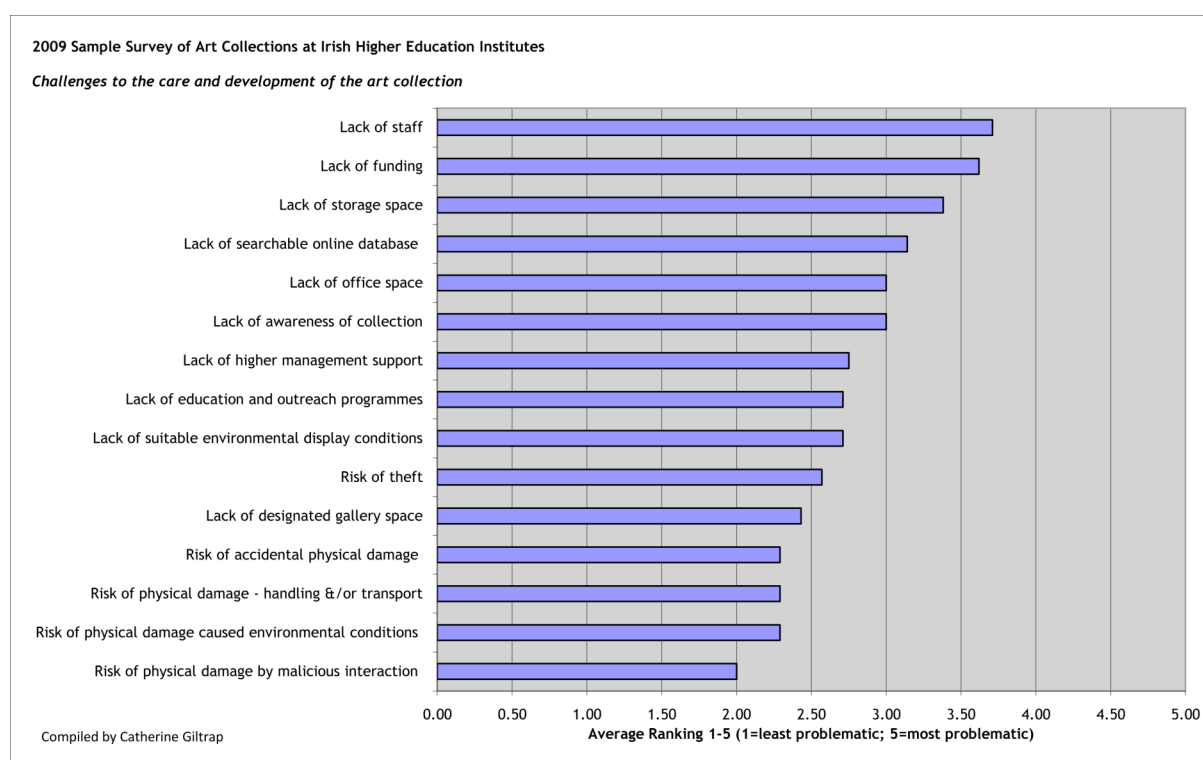


Fig. 3 - Challenges to the development of art collections at Irish Higher Education Institutes © Catherine Giltrap, 2009

During a recent piece of research into the role of university collections, I carried out a survey of eight university art collections in Ireland. The questions were based on previous studies by Kate Arnold-Forster (1993) and Melanie Kelly (1999), and the results revealed findings similar to the 1980s "triple crisis" referred to by Warhurst as "identity and purpose, recognition and resources" (WARHURST 1986). Lack of staff, funding, and space were identified as the main impediments to progress, and host

insitutions were perceived by curators to favour fundraising as a priority duty, while curators themselves ideally prioritised 'providing information', but in practice are afforded little time to conduct research to this end. As a practical step to improving the Irish situation, I have initiated discussions with experienced museum and heritage professionals in order to inaugurate an Irish equivalent of UMAC, which will initially focus solely on art collections but hopes eventually to promote the preservation and development of all Irish university collections.

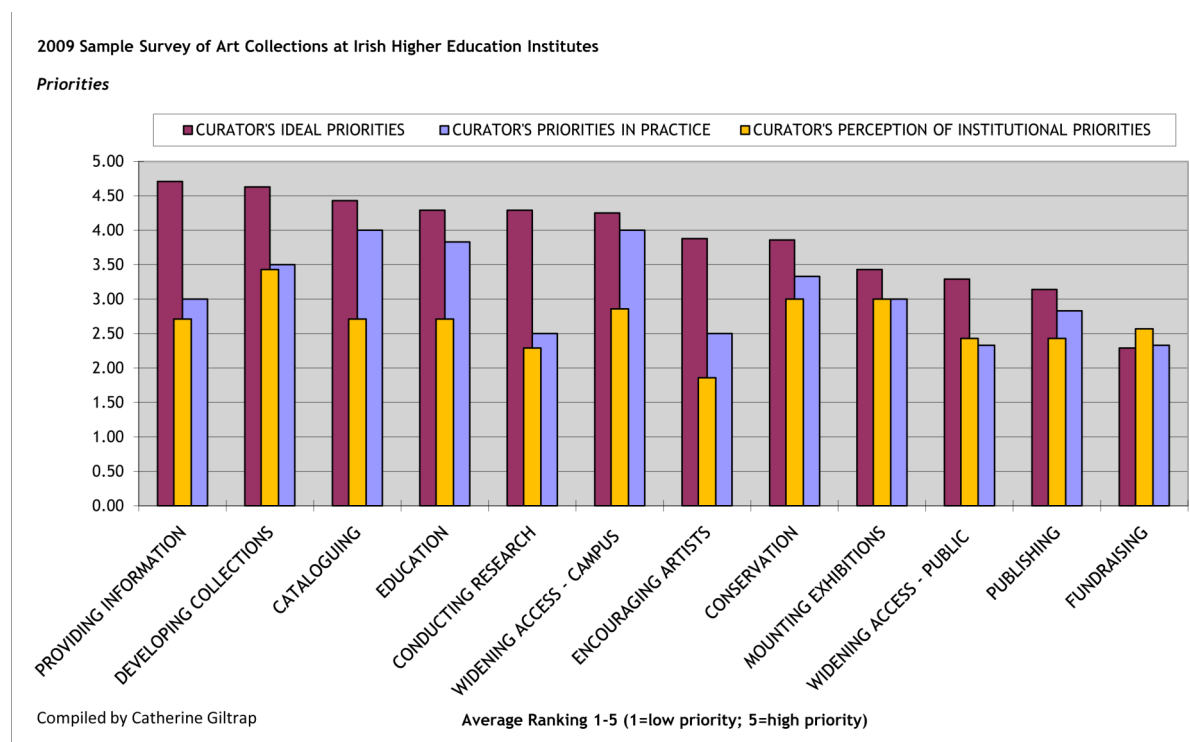


Fig. 4 - Priority issues relating to art collections at Irish Higher Education Institutes © Catherine Giltrap, 2009

Conclusion: Tangible progress

The academic year 2009 / 2010 is the fiftieth anniversary of the 'College Gallery' scheme at Trinity and offers an opportunity to formally commemorate the rich cultural contributions of the pioneering genetics professor, George William Percy Dawson and to demonstrate the potential of the university art collections. In 2008, Kati Heinämies wrote about the important human resources to which universities have access in terms of expertise, experience, and enthusiasm for learning. This breadth of experience and richness of abilities will be tapped into by inviting alumni, former and current staff, and students along with members of the general public to participate together to create celebratory exhibitions, a major publication, and related events, further strengthening the bond between formal academic programmes and community outreach. Following these anniversary events, the first programmes formally integrating the art collections as resources for research and teaching will roll out. In preparation for this increased access to the collections, the first online database is being compiled. Archival files are being centralised and catalogued, images are being digitised, and oral history about the collection and the artworks is slowly being recorded. Four summer internships funded by the Trinity College Dublin Trust and Association – the alumni generated fund that gave the first sum of money for acquisitions – have contributed to this program to enable the use of the art collections as educational and interpretive tools for academic program. Access has also been augmented physically, by increasing and rotating the artworks on display, and improvements are planned for the system of labelling and the provision of detailed artist biographies or sitter histories for

the portraits. The aim is to enhance the knowledge of those who study and work in locations where the artworks form part of the environment, to instill a connection with the artworks and the artists and the reason they were collected. Behind this is also a policy of preventive conservation, complementing that of access. By respecting the need for intellectual enquiry of a 15,000-strong campus and some 3,000 staff base, it is hoped that the college audience will in turn act locally to care for the collections displayed throughout a large campus forming the heart of Dublin, Ireland's capital city.

University art collections have the scope to reflect institutional values as well as the diverse character of academic communities. They can symbolise the university as patron, protector and collector of art, and can act as a didactic resource enhancing institutional prestige. Ideally, appreciation and scholarship should be brought together to generate creative programs and projects that may also produce new artworks, thereby expanding the collections. With the benefit of 20:20 hindsight, I look back to George Dawson – to emulate and build on his initiatives and enthusiasm, his involvement of a campus and a community beyond in experiencing and contributing to contemporary visual arts practice. Now, what had been informal, will be promoted as additional but complementary formal methods of engagement with the university art collections. Infrastructure is slowly being retrofitted both physically, virtually, and perceptually, and at the level of university governance and strategy to enable researchers and educators to employ the art collections as a gateway to higher education and a communicative interface – as the useful and inspirational educational and interpretive tools that they have been on standby to be for centuries.

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Contact

Catherine Giltrap, BA (TCD), MA Mus. Stud. (Leic.)
Curator of the College Art Collections
Address: Office for the Secretary, West Theatre, Trinity College, Dublin 2, Ireland
E-mail: catherine.giltrap@tcd.ie
www.tcd.ie/artcollections

Multidisciplinary learning and an extension beyond an exhibition. Presenting a case study: *Constructed landscapes: Singapore in Southeast Asia* – Exhibition at the National University of Singapore Museum

KAREN LIM

Abstract

An exhibition Constructed landscapes: Singapore in Southeast Asia is presented at the National University of Singapore Museum (NUS Museum) with the intention for teaching and research in various interdisciplinary levels and fields at the National University of Singapore (NUS) and exploring further development and opportunities within the education community in Singapore.

The year-long 2009 core exhibition presents a thematic and multidimensional approach on the Singapore landscapes and proposes a fresh reading and interpretation of the rich archive of artworks drawn from the museum's more than 50 year old Southeast Asian collection. Engagement is made with various teaching professors at NUS faculties from History, Geography, Sociology, South and Southeast Asian studies, Communications and New Media, Biological Sciences, and other tertiary level institutions to incorporate the exhibition as a teaching resource in their modules. Assignments are designed in-relation to course study and using the works as an informative platform for student's initial research.

In conjunction with the exhibition, forums and film screening are organized alongside five walking tours at specific sites in Singapore. This collective programming enhances intellectual discourse and critical thinking using various approaches to frame, cast contemporary issues of the nation, its city, architecture and the varied materials used in referencing the changing landscape.

Introduction

University Museums are essential to the academic experience and to the entire educational enterprise. But it is not new or surprising when University Museums worldwide are faced with adversity and decisions made to consider closing the museum, arranged and specified by senior administrative management without the involvement of museum staff and inputs from museum professionals. NUS Museum was also not spared and experienced 2 exercises. For three years (2005 – 2007), a special committee was set up by senior management to evaluate the closing of the museum and the potential sale of its collection to the state museums in Singapore. Two considerations raised were: a university's focus should be on education and not diversify its resources to manage a museum, and the university could gain a substantial amount from the sale of its collection.

As newly recruited staff at the museum, we were trying ways to inform the management that this University Museum (the only one of its kind in Singapore - the first Museum of art in Singapore and the then Malaya) was of historical importance to the University and the Nation, with its valuable collection and irreplaceable community service, have immense educational value. In order for the museum to show its relevance to its community and the richness of its collection, the permanent collection exhibition was immediately launched in late 2006 as an annual year-long series sourced from its Southeast Asian Collection.

History of NUS Museum and its collection

The University Art Museum (precursor of NUS Museum) was inaugurated in 1955 at the University of Malaya in Singapore. Michael Sullivan was appointed as the founding curator and lecturer in art

history (1954-60), started the collection in understanding modernity of Asia and the Malayan culture. This collection was instrumental in the teaching and study of Art History. Its holding of acquired paintings served as a vital archive and resource to interpret landscapes and themes in Singapore and Southeast Asia. The aims of the art museum in 1955 was to locate in the university a centre for study and enjoyment of art; provide a two year program in art history as a subsidiary subject; create a centre for research into the art and archaeology of Southeast Asia; gather a representative collection of civilizations that contributed to Malayan culture (SABAPATHY 2002).

In 1972, the vice-chancellor of the university conveyed his decisions to the Minister of Culture on his decision to close the art museum, citing two reasons: the disinterest of students in the study of art history and isolation of the art museum leading to the absence of visitors. The museum and art history department was closed on 31 January 1973 with the second curator, William Willetts' contract not renewed. Willetts who arrived at the University in 1963 was then approached to be the curator and art history lecturer at the University of Malaya, Kuala Lumpur after Singapore's separation from the Federation of Malaysia in 1965. The collection was divided into two and moved to be housed at the University of Malaya, Kuala Lumpur in 1972. On 26 February 2002, the remaining collections from the University was housed together and named the NUS Museum at the University Cultural Centre in campus. The Museum's collection today is diverse, ranging from classical Chinese and Indian materials to modern and contemporary Southeast Asian art.

Re-looking at the permanent collection exhibition

How do we conceptualize this? Exhibitions from permanent collections are important to museums. They reflect on the identity of the museum and re-enforces its mission and mandate. The educational role of the museum is a major justification and important function. Without an art history department at the university, our current team at the NUS Museum sees the Museum as a catalyst – integral to NUS, supporting NUS' vision of being global knowledge enterprise, leading global university centered in Asia, influencing the future. Our four main collections and practices are a resource for teaching and research to help NUS transform the way people think and do things through education, research and service. The museum's value lies in very tangible ways beyond heritage sentimentality.

Keeping the notion of the UMAC 2009 conference theme in using the university collections to work in research and teaching, I would like to present *Constructed Landscapes* exhibition, which I co-curated, as a case study to illustrate my point.

While working on the 3rd change of the permanent collection exhibition at the NUS Museum, I asked myself the following questions:

- How can we do it differently than the last 2 exhibitions on our permanent collection?
- How do we tie in with the theme on Art & Environment in the University's Art Festival for 2009?
- How can we relook at the mission and objective of a collection, which was first introduced as a teaching collection in 1955? Sullivan's mandate
- How do we make it relevant to students in the University?
- How could the works be used as points of learning?

From a collection of 8,000 objects with over 200 pieces of modern paintings at the NUS Museum, works on landscape was most predominant. Naturally an exhibition on the theme landscape was birthed. From the start, I was determined to explore and present the polarity of landscapes - the real and the fictitious, to reflect on the commitment to the geographical focus of the collection, which need not be presented in a chronological order and also to present how landscapes are mentally constructed differently by each person, according to one's experiences. Thus, the exhibition was

conceptualized as a thematic exhibition bringing together varied media with an underlying abstract narrative that is able to further decontextualize and construct.

Concept: Exhibition as a learning module

In the modern age, knowledge is no longer shaped by the secret, enclosed, circulating structures of the Renaissance episteme; nor by flat, classificatory table of difference of the classical episteme; now knowledge is structured through a three dimensional, holistic experience which is defined through its relationship to people. The act of knowing is shaped through a mix of experience, activity, and pleasure in an environment where both the 'learning' subject and the 'teaching' subject have equal powers. Subject positions are more closely related than in the past; former divisions are now bridged in a number of different ways. Where both the object and the curator are decentred, the audience has new opportunities (HOOPER-GREENHILL 1992).

With the selected artworks and a brief curatorial concept, the exhibition was proposed to two architecture professors teaching History & Theory of Southeast Asian Architecture to seek their collaboration to use the exhibition in their module. Once agreed, the exhibition's intention was to reach out to varied audience with programs designed as part of the components in the exhibition. We included two forums (for academics and students), film screening and walking tours (designed to supplement the appreciation of static display, which public can now personally experience the specific site physically and spatially). Separate Walking tours were also conducted for the architectural students.

With the agreement of the professors, varied roles and responsibilities were identified — each of the professors moderated each forum session, conducted a walking tour and planned their teaching syllabus using the exhibition with images of the selected works compiled by the Museum. One of the professors later suggested to co-curate the exhibition with me.

1. The Intention of the exhibits – Makers of culture

Without an acquisition budget, works were borrowed to supplement the gaps in the collection. Borrowing these works allowed us to include young and unknown talents in Singapore, and to revive our Museum's permanent collection with a renewed understanding of the work placed in context. The idea was to put the art (but not necessarily art history) into the forefront of our thinking. Works selected were intended to embrace varied media in the exhibition. They are now used as tools for students' own research and learning in varied fields rather than art for art's sake. This encourages and enhances multi-disciplinary learning.

Presented in three sections — "Engagement", "Memory" and "Imagination", these mark themes on the subject of landscapes through paintings, drawings, textile, video documentation and sculptures. Personal and collective memories, imagination, relationships with physical spaces, may all be discerned in the works. The depiction of landscape may be seen as entailing a cultural process for an artist: it emerges from and corresponds to everyday experiences and beyond. The sites represented may be interpreted as material registers of the physical landscape, or as symbols, metaphors of ideals.

The Museum has been known for its collection of Woodblock prints. To further the education of our repeated audience and art students, contextual materials are added to the section on prints specifically using the drawings and materials to accentuate the process of woodblock print and also borrowing a woodblock from the artist's family. With static objects selected, a film work by a medical anthropologist, Ivan Polunin was included. One of the earliest to own a colored film in the 50s, Polunin took landscapes of Singapore in the 50s – 70s. The film provides a glimpse of the cultural activities of

Singapore then, such as activities around the port of the Singapore River, the Buddhist nun initiation, Indian Thaipusam rituals, Malay wedding – all these scenes reflect an active, dynamic form and process of a living landscape.

2. Designing the brochure

The brochure was intended to be given freely to students from the modules. With a focused intention of the exhibition specifically for teaching and research, the design and layout of the brochure was also kept in sync as a reference material for students' use. Contents in the brochure include curatorial writings, a page dedicated to the gallery's layout specifying the works, a referencing system for the works to be seen as thumbnails and public programs for the whole year were listed.

3. Programs – Diversity of voices, community based and audience driven

Programs were created to complement the exhibition while at the same time addressing contemporary concerns. These can be connected to multi-disciplinary learning and timely topics to art and to the museum. Speakers from disciplines in Singapore history, urban planning, architecture and building conservation were invited to share their papers. The two forums on pre-colonial and post colonial landscapes, attracted a diverse audience from members of public, academics, students and even new residents in Singapore.

4. Worksheets for students by students

With limited resources at the museum, without an educational officer and only one active docent, I had developed two types of worksheets for younger audience – a simplified version for seven to twelve years old and another for 13 to 16 year olds. These worksheets were immediately downloaded into the museum's website for teachers who were interested in bringing school groups without the need of a guided tour.

Extremely effective idea was getting student interns to design worksheets for students of varied levels. Besides having the intern's ownership on the worksheets, it was an eye opener to see how the intern understood the exhibition and took leadership in "teaching" by designing three new worksheets for audience who are six years and below.

Cold call – Multidisciplinary learning

For a 'living' exhibition to be a learning module in campus, let me illustrate my point through this diagram of a communicative circle, which shows the evolving process of an exhibition that engages the communities, extends beyond the exhibition and translates its value within the education community. Works/ objects are used for study (through brochures and guided tours); extends to research and learning for students (with the help of the intended design and layout of the brochures); through experiential learning (walking tours, forums and programs) and coincide programs with major national festivals and the university art festival. Using this communicative circle, assignments are developed by professors through existing modules taught. With the year long permanent collection exhibition in placed, other temporary exhibitions and projects are planned to accentuate the learning.

Contact

Karen Lim

Assistant Director (Curatorial)

National University of Singapore Museum (NUS)

Address: University Cultural Centre, 50 Kent Ridge Crescent, Singapore 119279, Singapore

e-mail: karen_lim(at)nus.edu.sg

Of the sacred and the secular: Missionary collections in university museums

PATRICIA H. J. HUANG & JENG-HORNG CHEN

Abstract

In 1882, Dr George Leslie Mackay (1844–1901), a Canadian Presbyterian missionary, established the earliest higher education institution in Taiwan, the Oxford College (today's Aletheia University), and the first university museum collection on the island. After years of neglect, at the end of the 20th century, the collection was 'rediscovered' by Canadian and Taiwanese anthropologists from the Royal Museum of Ontario, Canada. Just as these illustrious artifacts embark on a new chapter in life, they also seem to be re-introduced with their original interpretations: items that Dr Mackay preserved to demonstrate the idol-worshipping and heathen beliefs of the 'savages' are, once again, seen from a pagan perspective. To date, they are deemed as one of the best resources available for contemporary researchers to understand the spiritual life and value system of the Taiwanese Aborigines.

Dr. Mackay's collection is extraordinary, but its history is far from unique. This paper aims to examine university museums whose holdings have strong theological ties. As user communities change and new research interests emerge, ecclesiastical collections have helped to shed new lights on secular scholarship on such topics as ethnography, folklore studies and even missionary work itself.

Of the sacred and the secular: Missionary collections in university museums

A missionary is a member of a religion who works to convert those who do not yet share his or her faith. Driven by the sense of fulfillment, a missionary is constantly engaged in reaching out. A university missionary collection is here defined as either a collection in a missionary university museum (museum in a seminary or a theological college), or a missionary collection in a university museum (museum in a secular university). In light of the frequent outreach and postings in far-flung places, a missionary has vast opportunities to build a rich collection of 'all things bright and beautiful, all creatures great and small', and which makes 'missionary collections' an interesting sub-set in the study of university museums. This paper will examine Dr Mackay's collection, Taiwan's first university museum, and the layers of meanings it has been invested with during its eventual journey. It argues that as the user communities change and new research interests emerge, ecclesiastical collections have helped to shed light on secular scholarship such as ethnography, cultural studies and even the missionary movement itself.

Part I

George Leslie Mackay (1844–1901) was born in Oxford County, Canada. In 1866, he graduated from Knox College, and went on to receive more theological training from Princeton Seminary, New Jersey, and New College, Edinburgh (MACKAY 1991, 19). In 1871, Mackay's application to serve overseas was granted by the Canada Presbyterian Church. He arrived in Taiwan (Formosa) at the end of the year, and settled in the island's largest harbor, Tamsui, a convenient jump-off point to the cities. From Tamsui, he made repeated trips to northern and eastern Taiwan, always with his bible and medical box in hand. Often, he led a group of people – for example, Chinese immigrants, lowland-Aborigines or highland-Aborigines ('savages'), to sing a hymn together before distributing anti-malaria drugs or performing mass dental operations in the public. His fluency in the native language was a big asset. Soon, chapels and a clinical facility were erected in this previous unchristian land.

In 1882, with funds raised from his Canadian hometown, he founded the Oxford College, Tamsui, Taiwan's first higher education institution, and to facilitate teaching, he also converted a residential

room to house the first museum in Taiwan. His famous collection comprised copious quantities of geological, mineralogical, botanical and zoological specimens, and “every conceivable kind of article of use or interest” (MACKAY 1991, 288–289) to Taiwanese inhabitants. To some extent, the museum was a throwback to the Renaissance’s ‘cabinet of curiosity’: a microcosm in itself. However, the all-inclusiveness must be considered as a result of practical necessity rather than trend revival: students in the Oxford College were asked to attend bible-studying as well as modern science classes (MACKAY 1991, 293). Venturing into uncharted territories is part of a missionary’s life, and it is vital that missionaries were given comprehensive knowledge to survive, succeed and sketch the unknown world to all on the outside.

Mackay’s students made good use of the museum, so did those visiting foreign scientists (MACKAY 1991, 288; 319–320). Having said that, the most eye-catching displays in the room were doubtlessly the overwhelming presence of idols, “enough to stock a temple”, and four life-sized figures “representing four sides of life in Formosa”:

In one corner is a Tauist priest, arrayed in his official long red robe, with a bell in hand to awaken the devils possessing any man, and a whip in the other to drive them out. In the next corner is a bare-pated Buddhist priest, robed in drab, one hand holding his sacred scroll, the other counting his string of beads. Opposite to him is a fierce-looking head-hunter from the mountains ... his spears at his side, bows and arrows strapped across his shoulders, a long knife at his girdle ... In the fourth corner is a savage woman, rudely attired (MACKAY 1991, 289).

Mackay’s attitude towards Chinese idolatry was far from acceptance. In his autobiography, *From Far Formosa*, Mackay gave a lengthy account detailing how resolutely he regarded it as vile and grotesque (MACKAY 1991, 128; 179; 207), and when new converts surrendered idols and ancestral tablets to profess their abiding faith in Christianity, he was obliged to make a bonfire of them (MACKAY 1991, 219; 231). Mackay held a more lenient view of the material culture of lowland-Aborigines and highland-Aborigines, even though by his own admission, the contents of his ‘savage’ collection were anything but civilized. “Some things are quaint enough, others suggestive of sad thoughts, others gruesome and repulsive, because indicative of ferocity and savage cruelty” (MACKAY 1991, 289). The collected ones were kept simply because of their research values.

Mackay took crates of museum exhibits back to Canada on his furlough in 1893 and donated them to his alma mater, Knox College, as a testimony to his work and an inspiration for future generations to answer the calling and join him abroad (M.E. Munsterhjelm, unpubl. data). This collection is no longer at Knox. A reasonable surmise is that when the University of Toronto partnered with the Government of Ontario to establish the Royal Ontario Museum (henceforth ROM) in 1912 (DICKSON 1986, 12), Knox College, by then federated to the university, transferred the collection to the ROM.

The ROM, the third museum that had stewardship of the collection, was a general museum with clear discipline divisions. The duties of curatorship were chiefly taken up by faculty members, and in the early days, there were five divisions in the ROM: archaeology, geology, mineralogy, paleontology, and zoology (DICKSON 1986, 34–60). Neither of these professors or curators had strong links to theology, nor did they seem to be aware of the Mackay Collection stacked up high in the storage. The ROM opened with much fanfare, but as it expanded, keeping the university and the government operating in concert became increasingly difficult. On the one hand, the government felt that it was the university’s liability to take care of the acquisition budget, but the university could ill-afford to appropriate more resources to the ROM. On the other hand, concerns for the university’s almost unbridled power over the ROM and the ROM’s ready tendency to prioritize the university needs over the public needs were constantly voiced (DICKSON 1986, 112–144). At last, the ROM outgrew its status as a legal appendage to a teaching university and was formally elevated to an independent entity in 1968.

The ROM continued to have a close bond with the university but also strove to enrich the wide-ranging exhibitions through various means. Ethnographical displays were one of its stronger features, and could be seen in the re-structured 'Archaeology' and 'Near Eastern and Asian Civilization' divisions. Nonetheless, it was not until the 1990s when two Canadian researchers tracked down the Mackay Collection did the collection see the light of day again. Two Taiwanese anthropologists were invited to assess the 'discovery', and they proclaimed that it contained one of the best, if not the best, batch of Taiwanese aboriginal artifacts from pre-colonial period (before 1894). Many of the items had never been seen before except in books, and were probably the last vestige of the 'pure' aboriginal culture (M. E. Munsterhjelm, unpubl. data).

A loan exhibition request was put forward by the Shung Ye Museum of Formosan Aborigines, Taiwan, in time for the centennial anniversary of Mackay's death. Out of the 850-odd objects found, 192 were chosen to make the trip. Aside from a few boar and deer skulls, Mackay's proud "marine shells, sponges, and corals of various kinds [...] serpents, worms, insects" (MACKAY 1991, 289) were conspicuously missing in the line-up. Given that the organic exhibits might be too fragile to be moved and their presence could not help accentuate the aboriginal color of the Shung Ye Museum, the absence was justified. However, it can not be denied that the new interest in the Taiwanese Aborigine's early life rendered those once under-appreciated artifacts exceptionally important today.

It is safe to conclude that for Mackay, the purposes of his collection were twofold: helping missionaries grasp the native culture and providing a before/after contrast of the encounter with God. In short, the religious curios, the 'indecent' clothes, and the primitive weapons were material proof why the Aborigines were in dire need of Christian enlightenment. The thought that one day these slighted objects would command absolute attention in his memorial exhibition, 'Treasures from Abroad: the Dr. Mackay Collection of Formosan Aboriginal Artifacts', probably never crossed his mind. Yet for contemporary anthropologists and Aborigines, the 'evangelization-aid' collection not only fills a void in scholarship, but also gives impetus to the ethnic resurgence movement (M. E. Munsterhjelm, unpubl. data). Written history is a notion elusive to Taiwanese Aborigines, as their languages are limited to verbal forms only. Moreover, the intervening years of suppression and acculturation policy inflicted by the governments have quickened the disappearance of customs and the extinction of languages. To some, Mackay's collection is a pale version of those made by God-fearing, 'civilized' people, but to others, it is a powerful collaboration of the interview findings and oral stories. Take the wild boar and deer skulls as an example: they were, in fact, worshipped by certain highland-Aborigines for their supernatural power in honing hunting skills, and for the first time in many decades, what could only be envisioned comes to life through the blood-stained exhibits. Pagan or not? We are indebted to Dr Mackay and the university museums for the chance to re-situate the artifacts in a historical framework, and for the gazing and interpretation-giving to play out infinitely.

Part II

Although all university missionary collections have theological ties, in essence, they are not different from any other university collection: its aim is to, first and foremost, create a nourishing research environment for university members and perhaps for the public, too (COLEMAN 1942, 5); it has a specific collection display policy framed around the curriculum (KING & MARSTINE 2006, 282); and its management and finances rely heavily on students, faculties, board of trustees, alumni and the general public (DYSON 1990, 68).

However, the connection between missionary collections and universities is significant in both depth and breadth. Some of the earliest university museums we know of include the Ashmolean Museum, bequeathed to the Oxford University by Elias Ashmole in 1682 (MACGREGOR 2001); the 'Amerbach cabinet', purchased by the Basle city council in 1661 and made it accessible to the public as university

property (ACKERMANN 2001, 84); and the Museum of the Collegio Romano in the Jesuit Roman College in 1651 (FINDLEN 1994, 126). But while both the Ashmolean collection and the Amerbach cabinet had come to fame long before being incorporated into the universities, the Museum of the Collegio Romano, entrusted to Athanasius Kircher's curatorship, was firmly attached to the college since its formative years. Under the aegis of the college, the museum grew steadily to be the depository center of Kircher's inventions and the college's propaganda front. The museum was, as Kircher himself boasted, 'the centerpiece of a visit to the Eternal City' (FINDLEN 1994, 130). Kircher is not alone. Missionaries are the spearheads and enforcers of religion disseminations, which include, but are not limited to, Catholic and Protestant ones. They fan out through the world, and almost all of them have the time, knowledge, disposition and opportunity to be zealous collectors. Some of these collections may go to seminaries, and some to secular places such as universities or public museums.

The theological tie is what defines a missionary collection, but since a myriad of collections have been amassed over the course of time, and any of them can at some point be placed in a spatial-temporal context in which the users do not always conform to the dogma, there is inherently a 'sacred vs. secular' tension lurking. Especially in social science area, the frictions seem sometimes to be palpable. As missionaries need to immerse themselves in local culture to gain a foothold, they are likely to gather strategic ethnographic collections with relative ease. But for anthropologists or such, whose disciplines benefit from missionaries' groundwork and enjoy a historical vantage point (COOMBES 1985; KEESING & STRATHERN 1997; RUBEL & ROSMAN 1996), the methodology of the collection formation could hardly be flawless. Missionaries do not turn up on the cusp of changes coincidentally; as they are present to inculcate new sets of ideas, their presences presage, or are, the changes. The quality and quantity of their collections are built on the harsh reality that missionaries are often the only ones who can 'save' or 'salvage' what they will sooner or later eradicate or destroy (LAWSON 1994, 143). The irony was certainly lost on Mackay when he severely criticized the Chinese for forcing their idolatry on nature-worshipping lowland-Aborigines. "Whenever a tribe submits, the first thing is to shave the head in token of allegiance, and then temples, idols, and tablets are introduced" (MACKAY 1991, 208). How, one may ask, could Western cultural importers see themselves superior to the Chinese cultural importers? The ROM, once a university museum and at no time subordinate to any religious institution, was conscious of the different perceptions and careful enough to skirt around the differences. Lest Mackay's deeds should be obscured by the 'Western-biased' accusation, a "hero-rescues-Aborigines" (M. E. Munsterhjelm, unpubl. data) exhibition narrative was concocted to appease all organizations involved. One more stinging issue pertinent to collections formed by 'agents of cultural change' (STIPE 1980, 165) is, when the geo-social-political condition of the culture changes again, repatriation demands may haunt the current owners. Again, the ROM took all precautions to neutralize the subject and insisted on having the 'Immunity from Seizure' treaty signed before shipping out the collection to Taiwan (M.E. Munsterhjelm, unpubl. data).

Many and various missionary collections have been assembled, disbanded or re-grouped around the world. The fact that they are highly desirable and constantly moved is due in no small part to the peculiarly itinerant missionary life, and many of them do, at some time, find themselves behind glass cases in a university museum. For instance, we can easily find Mackay Collection's parallels in the Redpath Museum, McGill University, Canada, a secular university museum that houses a 19th century Presbyterian missionary collection (LAWSON 1994), or in the Tenri Sankokan Museum, Tenri University, Japan, a missionary university museum that collects Taiwanese aboriginal artifacts, to name just two. The nature of missionary work is all about interfacing: interfacing within the same group but of different times, interfacing between different groups; and in the above-mentioned and, in effect, all cases, when putting university missionary collections to work in research and teaching, the interface between the sacred and the secular, between different disciplines within the universities, between communities

inside and outside the universities. The results may be expected to produce many strata of meanings, some conflicting, some complementary, for us to reflect and contemplate.

Part III

There was an almost fossilized impression that early missionaries were mostly ethno-centrists riding on the crest of imperialism, and the template of their collections was underlined by an unerring sense of justice: objects of heathenism, barbarianism, indecency and exoticism (COLEMAN 1985; THOMAS 1991, 153–157). But this impression only tells part of the story (COOMBES 1985, 453; HASINOFF 2006, 147). Thanks to the intricacy of missionary networks, missionary collections are scattered in universities worldwide for researchers to continue cross-examining the impression and mining for fresh ideas.

One afterthought is, is a university collection easily overlooked or dispersed? The George Brown Oceanic collection, gathered by the Methodist missionary, was sold three times to museums on three different continents, including the Hancock Museum, University of Newcastle, England (GEISMAR 2001, 32–33). The Mackay Collection has been registered in three university museums, too, and its current staying place, the ROM, was in such a management and financial quandary that it had to be split from the University of Toronto.

It is true that these two are separate incidents and no conclusion should be extrapolated from them. However, missionary collection or not, a university museum is only one of many units under the parental organization: the university (WALLACE 2006, 161). Unless the museum can justify its existence in research or teaching, it is unlikely to receive any preferential treatment from the board of trustees, and the same rule applies when the museum directs its supplication to outside patrons. But how can a university museum justify its existence? As we said earlier, the motto of missionary, reaching out, may have pointed us a good place to start.

The word 'university' implies 'universality', and it falls onto the responsibility of museum curators to exploit joint research or teaching opportunities among the broad spectrum of disciplines encompassed in a university. Take missionary collections as an example again. In addition to the 'usual suspects' such as anthropology or cultural studies (STURTEVANT 1969, 637), there are many candidates which can develop symbiotic relations with the collections: How about chemistry? Could it learn from preserving old things and how much could it do to slow down their deteriorations? How about pharmacology? Are the herbs or sachets in Mackay's match-box containers just another form of superstition or alternative 'food for thought' for new medicine? How about economics? Could the students appreciate that it is not the intrinsic value, but the face value, of the beads that counts in a currency system? Could we all agree that an object has no meaning until been given one (KIRSHENBLATT-GIMBLETT 1998)? Sometimes it may be necessary to amalgamate a team with many specialties to effectively tackle a research problem. But if reaching out and communicating have kept missionaries going, maybe they will do the same for university museums, too.

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Contact

Dr Patricia H.J. Huang

Assistant Professor, Graduate Institute of Museology, Tainan National University of the Arts, Taiwan

Address: No.66, Daci Village, Guantian Town, Tainan County, Taiwan

E-mail: pathuang(at)mail.tnnua.edu.tw

museum-en.ncku.edu.tw/bin/home.php

Dr Jeng-Horng Chen

Associate Professor, Department of Systems and Naval Mechatronic Engineering & Chief of Research Division, NCKU Museum, National Cheng Kung University, Taiwan

Address: No.1, University Road, Tainan City, Taiwan

E-mail: chenjh(at)mail.ncku.edu.tw

Online collaboration and knowledge dissemination for university collections

ALAIN MASSÉ & WILLIAM HOUTART MASSÉ

Abstract

Universities and university museums are faced with numerous challenges regarding access to their collections for diverse user communities. In today's electronic age, a new model has emerged for granting online access to collections. This paper will present some challenges and successes of current solutions in use by Carleton University's Great Lakes Research Alliance for the Study of Aboriginal Arts and Culture (GRASAC), the University of Pennsylvania Museum collaborative virtual exhibition Tipatshimuna and the McCord Museum, formerly administered by McGill University. The research and knowledge dissemination mandate of universities, together with the issues surrounding the repatriation of objects, online collaboration and access to collections, the digital form presents a real opportunity to benefit universities, researchers, students and the general public.

What is cybermuseumology?

"Cybermuseumology is an approach; it includes everything from a museum's qualities to its values and transposes it to a new medium – in short it is the accomplishment of the museum's mandate through a Web-based portal" (Éric Langlois, unpubl. data). Cybermuseumology as a concept has been emerging since the mid-1990s. The pioneers of this discipline believed that the possibilities were endless; and they were right. Their belief that the museum website could be more than just a place to display information about the physical location (address, opening hours, etc) led to the display of actual museum content online. The goal of cybermuseumology was to make museum content accessible to the general public, but also to communicate to new specific targeted audiences (youth groups for example). The internet created a structure for innovation in the museum field supporting this goal. The web provides the means to democratize heritage just as Malreux envisioned photography. During the early stage of cybermuseumology, museumologists witnessed a mass digitization of collections stored in databases. Storage space online was far more obtainable and inexpensive than museum floor space, both to develop and maintain – making it possible for museums to virtually display far more material than they could in their physical locations. The results were rich virtual collections of raw materials that unfortunately meant little to the general public. To address this gap, museum educators, curators, and other interested parties began to work with these un-interpreted collections and create the first virtual exhibitions, online interactive educational activities and, eventually, entirely virtual museums. Cybermuseumology became a field of study and expertise. Today, programs are taught throughout specialized universities in Canada such as l'Université du Québec en Outaouais (Gatineau).

Open source and Web 2.0

The internet's infrastructure has not changed much, however its content has definitely evolved. Today, there are enormous quantities of relevant interactive information for research, teaching, etc. Not only has the world generated new content but new concepts were created, new possibilities emerged, and reaching out to a larger public has never been easier. Open source is a concept that enables communities to build new communication and dissemination tools. These tools are accessible on the internet, and with little customization and (possibly more importantly) limited budget, museums can use them for their specific needs.

Web 2.0 simply means: a set of specialized tools designed to generate social interaction. Many of these tools (RSS, Tagging, etc.) have been created by the open source movement. The Open Source Initiative describes the free access to software's source code with the possibilities of redistribution and

customization. Social media, born from this initiative, started a cultural and knowledge revolution: it contributes to the construction of contemporary intangible heritage around the world. Museums, archives, libraries, universities (MALU) known as collection holders have paid a great deal of attention to this trend, though social media is in fact only the tip of the iceberg. MALU democratized world heritage in a new collaborative dimension. Malraux's vision of a museum without borders is a XXI century reality.

To help demonstrate the large scope of this new trend, this paper examines three case studies: Tipatshimuna, GRASAC and THEN/HiER. Some museums have already found Web 2.0 useful to expand research opportunities. In these cases, the user or "visitor" becomes an actor and interacts with the collection to further document it, rather than merely consume it. Museums should stay on the look out for new cost effective ways to improve practices. Technologies have proven time after time the benefits of being an early adopter.

Collaboration

The following sites are built on, and depend upon, continued collaboration. The technology itself is weak when it comes to content; it is provided by the community the tool is designed for. Users can add new content; others can update, comment on it, or add to it. The resource then becomes dynamic, and it evolves at a constant pace with the community's knowledge. Collaboration is a powerful means to drive knowledge further, faster. Distance and lack of resources have all too often limited the exchange of knowledge; technologies can be used to minimize these limitations. Previous information technologies have made things easier on a smaller scale – but the main advantage of these new platforms is that they get a lot of people involved relatively quickly. Some of the impact this can have on MALU's collections is obvious, but there are other benefits that are less immediate. Collaboration platforms have already shown themselves effective by making collections flourish by means of research, education and preservation as the following cases studies will demonstrate.

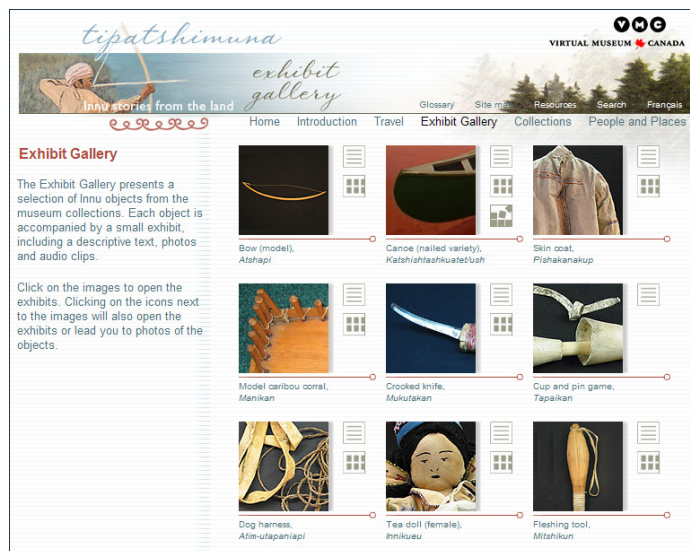


Fig. 1 - © Virtual Museum of Canada, www.tipatshimuna.ca

Tipashimuna

Tipatshimuna is a bilingual virtual exhibition that focuses on the heritage and traditions of the Innu people, using their own words, stories and material culture. It was realized between 2005 and 2006 with the help of the Virtual Museum of Canada's virtual exhibition investment program and partners such as the Rooms Museum (Newfoundland), the McCord Museum (Montreal), the Musée amérindien de Mashteuiatsh (Québec), the New Brunswick Museum, the Peenamin McKenzie School (Labrador) and the University of Pennsylvania Museum.

Tipatshimuna was recognized by the Canadian Museum Association for outstanding achievement in multimedia, and AVICOM (ICOM's international committee for the Audiovisual and new Image and Sound Technologies) for the Web'Art Gold Award.

This project was created in order to prevent a tragedy: the lose of a First Nation's cultural heritage. Concerns of losing this piece of history is a great fear in the Innu community, but also among most Canadians. This project took the spotlight because of its innovative solutions for the preservation of the Innu's oral traditions and intangible heritage, and for creating a means to prevent this tragedy.

This site was developed to not only provide a space for the Innu people to showcase their history to a world wide audience, but to give them the skills and tools necessary to maintain the site after it was developed. This was an exercise in virtual repatriation, allowing the Innu to regain control over artifacts that are stored in museums as well as preserve their intangible heritage, such as stories and memories. A gallery and search engine display a rich digital collection of objects that can be searched by keywords in English or Innu-aimun.

The entire project was run as an ongoing focus group. The web was chosen as the perfect medium to showcase Innu collections and stories because of its accessibility, but the internet was frightening to some of the elders; part of the project was to educate them on the benefits on using such a portal. CHIN, Idéeclic and The Rooms Museum met with the Innu Nation many times throughout the project's development, talking to elders, youth and other members of the community. The site was tested at several stages, to ensure ease of use, as well as respect for the Innu people and their cultural artifacts and heritage. Their insight was vital to the project's success. Sometimes, these focus groups were very large, encompassing many different members of the community.

Content was successfully added to the platform but it has not been as dynamic as it was hoped for. In order for the content to become a powerful resource, the community's youth would have to value the portal as their own and get more involved; the Innu people are the experts when it comes to their collections, stories and culture. Parties involved in the Tipatshimuna project hope that with time they start documenting their tradition with the help of this tool.

GRASAC

The GRASAC Knowledge Sharing Tool (GKS) is a wiki-style collaborative work environment that allows scholars in history, art and First Nations culture, along with several First Nations communities in Canada, to share information on Aboriginal artefacts contained in collections in many different

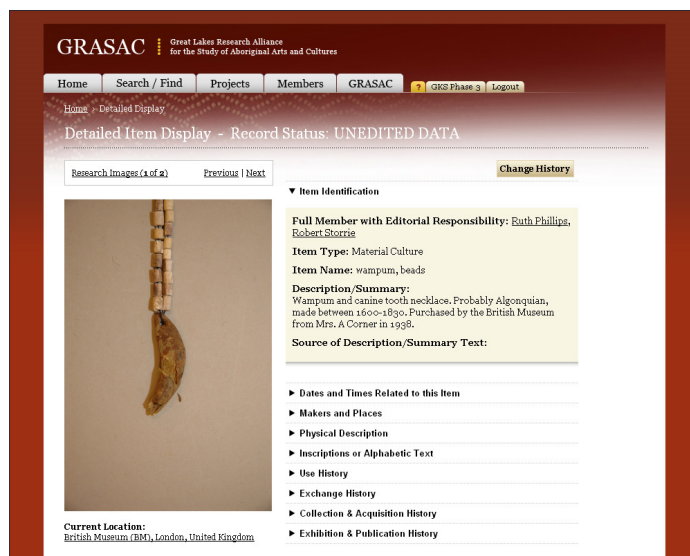


Fig. 2 - © GRASAC, grasac.org/gks/gks_about.php

repositories across the globe (heavily concentrated in the UK, Canada and USA). Aboriginal artefacts sometimes end up in museum collections with little information or provenance to accompany them. Records may be spotty, incomplete or could even contain misinformation. The goal of the GRASAC tool is to provide high quality expertise and multi-disciplinary collaborative research to help fill the gaps in museum records, as well as to create a space for knowledge sharing between individuals studying in this field and those possessing traditional knowledge.

To develop the GRASAC Knowledge Sharing Tool, various functionalities were created: multiple user access levels (administration, member, researcher, guest), login and user

verification system, a member directory, a collections management database including multiple types of data and the ability for users with certain access rights to add or edit records, add images, relate items to one another and leave comments.

Comments are linked to each user, and can be attached to text, images or other information within the system. Users can also make links between related artefacts, and specify why these artefacts should be linked; for example, two wampum belts in two museums are from the same treaty negotiation.

The GKS tool also contains powerful advanced search features, allowing users to search for open ended date ranges, keywords in various fields of the database, as well as by category and catalogue number.

Future developments include online collaborative workspaces, full administrative module, user-generated bibliography module, data harvesting system (to draw information directly from museum online databases), offline data-entry tool for research trips and additional comment tracking features.



Fig. 3 - © THEN/HIER, www.thenhier.ca

THEN/HIER

The History Education Network (THEN)/Histoire et Éducation en Réseau (HiER) is a collaborative network of diverse professionals in the fields of historical study, curriculum development and education in Canada. The goal of the network is to bring together people from across Canada to inform, carry out, critique, and implement research into the methods and implementation of historical education. THEN/HIER and Idéeclic worked together to develop a Drupal (an open source software) based collaborative website that allows them to engage partners in discussions (via forums and commenting features), critique curriculum documents, share ideas and develop collaborative projects.

The site allows members to:

- add content such as videos/podcasts or project descriptions;
- start forum discussions on research, policies, etc.;
- share their work with others from across the history education community.

The site also is a communication platform with a bulletin mailing feature, RSS feeds, polls and member messaging functionalities. Site contents can be accessed in the user's selected language (English or French), however communication between the two languages is facilitated by providing multilingual forums, and commenting in both languages on documents labelled "bilingual". Basically, when this type of document is created, even if it is translated, the comments provided on either language show up on both pages. French comments will show on the English document and vice versa.

Conclusion

The growing expertise in the field of cybermuseumology allowed these platforms to be developed to increasingly better suit the needs of the university museum community. They are constantly being customized and new features added according to best practices in the fields of technology and museology. Tipatshimuna, GRASAC and THEN/HiER demonstrate the evolution of these practices in a short lapse of time. These projects have all contributed to today's knowledge concerning the many applications of Web 2.0 features. It has rendered collaborative and decentralized research possible, and accelerated the documentation of museum records across the world while contributing to fulfil the museum's mandates.

Contact

Alain Massé

President and CEO of Idéeclic

Address: 320, boul. Saint-Joseph Blvd, C./P. Box 79118, Gatineau (Québec), J8Y 6V2, Canada

E-mail: [am\(at\)ideeclic.com](mailto:am(at)ideeclic.com)

www.ideeclic.com

William Houtart Massé

Officier, International Development

Address: 320, boul. Saint-Joseph Blvd, C./P. Box 79118, Gatineau (Québec), J8Y 6V2, Canada

E-mail: [am\(at\)ideeclic.com](mailto:am(at)ideeclic.com)

Saving our contemporary scientific and technical heritage with a safeguarding methodology

YVES THOMAS & CATHERINE CUENCA

Abstract

Science and technology have never known such advances as in the last 60 years. Consequently, the ideas and objects from the people that have made the events and milestones of scientific evolution in their university research laboratories deserve to be carefully stored, despite the sheer mass, diversity and no doubt redundancy of information. One method of doing this consists of safeguarding information selectively and virtually in multimedia databases, which can be consulted via web sites devoted to our modern scientific and technological heritage.

These multimedia items include descriptions and photos of instruments, patents, coursework notes, prototypes, but also videos of interviews with researchers, and explanatory animations, all of which can be used to create coursework in scientific culture for master degrees, to create exhibitions on start up companies from recent innovations, to reconstitute the history of a research laboratory, to make collections of objects performing a common function but that are geographically distant, to describe the career of an exceptional researcher, and so on.

Work of this kind has been started locally, at the University of Nantes, for the last 10 years or so, and the methodologies developed have spread to several other regions in France, under the supervision of the Paris museum of scientific invention, the Musée des Arts et Métiers.

This report aims to describe the different objectives, the methodologies used, the results obtained, the successes and challenges, the advantages and limitations, the outcomes and the international potential of such a project.

Introduction

What does it mean when we speak of our "contemporary scientific and technical heritage"? It is the instruments, machines, tools, prototypes, systems, patents, documents, processes, written or spoken interviews of the last 60 years, which has been an intense period of scientific and technological revolution. Yet, when we talk about heritage, we are really talking about material and virtual objects, which are waiting to be rescued and preserved. These objects present difficulties as they are often opaque, lacking in aesthetics, unremarkable, complex and complicated to explain. Furthermore they tend to proliferate and so require selection criteria. One example of this could be the different types of electronic microscopes (confocal, sweeping, transmission, atomic force, force modulation), but there is an endless list of similar examples: various radiological devices (gamma camera, scanner, MRI, PetScan), underwater observational systems, dating from the first submarines to underwater robots, astronomical observation systems from optical telescopes to satellite-borne electronic telescopes, and of course, computers, from the unwieldy unusable ENIAC of 1946 to today's powerful compact personal computers.

From these few examples, we can see the short-fallings of classical methods of conservation and traditional museology. Our ten years of effort to save this heritage brings a vital question to the fore: what resources and methodologies do we need to use to preserve these types of objects and to bring value to them once preserved?

But before we look more closely at that question, let us try to characterize the last half century of scientific and technological achievements to understand the task ahead of us.

Contemporary techno science

Contemporary science has dramatically altered in scope, expanding from the infinitely small to the infinitely large.

In the 1960s, the observation and understanding of phenomena were carried out on a scale of micrometers, but today, these same procedures occur on a scale of nanometers and angstroms, on an atomic and subatomic level. Scientific observation has been enriched with digital simulation and miniaturization engineering, which have caused an extraordinary boom in microelectronics, in molecular biology and in the synthesis of new materials. Microelectronics in turn created micro-computing, digital telecommunications and control command systems. Molecular engineering led to genome sequencing and genetic engineering. Material engineering led to innovations in products with specific characteristics and performances.

On the other extremity of the scientific spectrum is what is commonly known as Big Science, particularly devoted to space and nuclear research, with bodies such as NASA and the European Space Agency, the American Department of Energy, CERN in Geneva and not forgetting ITER in Cadarache. This Big Science is characterized by gigantic installations (the Los Alamos and Brookhaven accelerators in the USA, Troitsk in Russia, the Large Hadron Collider at CERN in Geneva, the ITER fusion reactor in Cadarache) where researchers from a multitude of domains and from the whole world over work together. Science is globalized, a task made easier by powerful computer networks.

For economic reasons, the Big Science phenomenon remains limited and concentrated, but it now has repercussions on standard research laboratories as their trustees seek to expand, by external growth and mergers, and to create multi-disciplinary and multiple approach scientific environments. This does not stop the inventions or discoveries outside of Big Science from being mostly individual, but the innovations that result from it and their derivatives are by nature largely collective, as they involve manufacturing and production technicians and engineers, sales and marketing services, trainers and strategic planners.

In the same vein, science and technology have come closer together, in a sort of cross-pollination process. Research and industry have developed closely together in scientific or industrial parks, and other Silicon Valley type installations, and startups or spin-offs are closely linked, hence the increasingly common term of 'techno science'. These techno sciences have rapidly entered into common usage, with everyday life affected by microelectronics, micro-computing, plastics and composite materials, which are all around us in housing, cars, workplaces, community and leisure centers.

We can see that the material artifacts of this type, stemming from the techno scientific innovations of the last 60 years, always have a complex history and context (HALLEUX 2008). We should not separate these objects from the men and women really involved in creating and using them. By contributing their written and spoken memoirs, these people may make up an indispensable immaterial heritage to complement the real objects.

A first step is to ensure that the scientific instruments, and concrete research and innovation artifacts from the second half of the 20th century do not disappear forever from labs and research departments. Secondly, it is vital to interview the growing number of research professionals who helped in the creation of these labs and worked in them, and who are one by one retiring from professional life. The same applies to the engineers who contributed to the major works in computing, aeronautics, and the space industry among others.

Our project

Following a first experimentation at University of Nantes in 1996 (CUENCA-BOULAT 1997), a mission for developing a documented inventory was created in 1999 in our region of France, where four universities are located. A regional program to preserve contemporary scientific and technical artifacts was launched on an experimental basis. Under the supervision of a scientific committee its primary objective was to safeguard technical objects but also the accounts given by inventors and users of those objects, in a multimedia format. We developed simultaneously a database of several thousand objects, and DVD-Roms that narrate the stories of research and researchers, in the disciplines of acoustics, the rubber industry, cardiology, organic chemistry, embryology, process engineering, electrical engineering, nuclear medicine, micro-encapsulation, marine environments, neuro imaging, plant bacteriology, intellectual property, nuclear magnetic resonance, botany and renal transplantation (CUENCA, THOMAS & BALLE 2005).

As soon as sufficient internet data flow could be made available, we placed all these results on a website, dedicated to cultural professionals, teachers and the general public¹ and an initial study of the use of these multimedia products has been carried out.



Fig. 1 - This web site www.patstec.fr should have an international version soon.



Fig. 2 - In this multimedia product, 17 researchers tell the stories of their successes, mistakes, changes in direction and talk about their instruments and innovations.

In 2003, to continue this pioneering program, the government's minister for research appointed the Musée des arts et métiers in Paris to carry out a national conservation mission, to safeguard the contemporary scientific and technical heritage of higher education institutes, research centers and companies (THOULOUEZ 2005). The aim of this is to encourage regional initiatives within a national network and to give advice and expertise towards the creation of contemporary science and technical museums. The national mission seeks to preserve the living memory of research, by collecting scientific instruments that testify to public and private research, including the major documentation associated with that, from workers in higher education, research and industry.

This greatly diverse heritage in its entirety will be a major tool to help the general public understand the knowledge, techniques and innovations involved and provide a basis for introducing young people to careers in these domains.

¹ This site can currently be viewed at www.patstec.fr (accessed December 13, 2010).

Today the national database is made up of more than 5,000 records (CUENCA 2005), enriched with more than 20,000 photos, videos, texts or animations. Partnerships have also been set up with companies such as EDF and Essilor and with CERN in Geneva. The national mission is becoming a European one, which will involve several major museums, and several universities in the hope of creating an international, multicultural site.

Some methodology

Without going into too much detail of the preservation methodologies currently developed and applied, let us look at some basic principles that must be respected.

- A practical community has to be developed as close as possible to the objects that need preserving. This may involve networks of retired researchers interested in the project and networks of working researchers, as laboratory correspondents. This community can also promote awareness among the users of objects and organize temporary or permanent exhibitions.
- As with any large project, a project head must be appointed, to coordinate, organize, fix objectives and mobilize human resources and funding.
- It is important to build a scientific council around a preservation project, as it ensures that the process will be consistent and of high quality. It is important to cover the main scientific domains (such as physics, chemistry, biology, engineering, astronomy), but also to involve scientific and technical historians, and, for promoting the work, sociologists and marketing specialists.
- Historical preservation occurs in several stages: creating researcher awareness, finding objects and connected parts, sorting through objects, collating and tagging, documenting catalogued objects and interviewing the people that know about them.
- The safeguarding process must make full use of today's information technologies: obviously digital collaborative working environments, but also knowledge management and e-learning.
- Catalogue entries of artifacts and 'actors' must contain the item name, a brief, precise non-encyclopediaic description of it, its location and associated items: remember that any recent instrument is generally but a part of a whole, and any researcher has always had co-workers.
- Interviews with researchers must be carried out along two main guidelines: firstly, scientific explanations must be clear, concise, and instructive, and secondly, the interviewee should be encouraged to be natural and emotive in order to tell the story of his or her discoveries or of a laboratory in the most interesting and efficient way.

Creative usage through ICT

We previously developed the idea that objects only have interest and meaning when they are accompanied by the words and explanations of the men and women who have used or created them or made them evolve. To bring value to these preserved artifacts, digitized works must be created, involving the authors and players. Generally speaking, these works do not yet exist and have to be created from scratch. A digital conservation bank has to be created to safeguard this knowledge but also to display and debate it in a pedagogical and aesthetic aim.

Through 'researcher stories' developed and stored in multimedia products, we mean to tell what happened, backed up by the objects used or created, and in doing so, show the roles played and work undertaken by researchers and their relative importance in the advancement of knowledge and sometimes in economic development.

And by telling the 'research lab stories', again through multimedia products, we wanted to explain how innovative individuals and teams of divergent skills can work together over time, using increasingly



Fig. 3 - A success story: M. and G.J. Martin contributed to create the Eurofins company that today involves more than 5,000 people worldwide.

effective instruments, in order to reach goals set by watchful scientific committees. These digital history books, from which you can easily access videos, are a powerful tool, showing the real players involved in these stories and using this realism to emphatically explain and persuade.

In contributing to a real exhibition (but through the use of digital panels), on the 50th anniversary of Essilor's Varilux glass, we wanted to explain that between the individual discovery of progressive lenses and the actual commercial success of that innovation, there were decades of collaboration between numerous specialists in

manufacturing, instrumentation, advertising and management. We can imagine that a three-dimensional virtual exhibition online could be a fascinating way to extend such a 'real' exhibition, with room for improvements and updates.

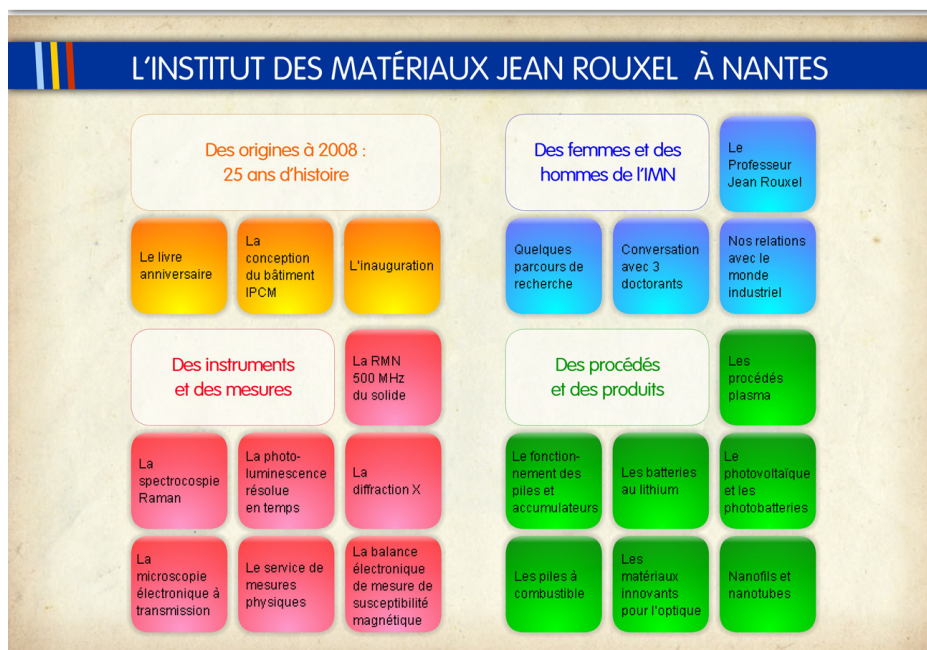


Fig. 4 - This is the cover page of the history of a research laboratory: the Institute of Materials in Nantes (France). There are four parts: a historical one, administrative and scientific, recounting 25 years; staff members (the founder, some key researchers, and young doctoral students); instruments and their evolution over this period of time; innovative processes and products.

We recently developed modules of an information science masters covering the most innovative scientific and technological domains of recent years. By proving these via links on the Patstec web site, we were able to offer students a digital product adapted to today's interactive learning, and

encourage them to build similar products themselves through a compulsory technical-scientific scheme of work.



Fig. 5 - A digitized masters course in scientific and technical culture.

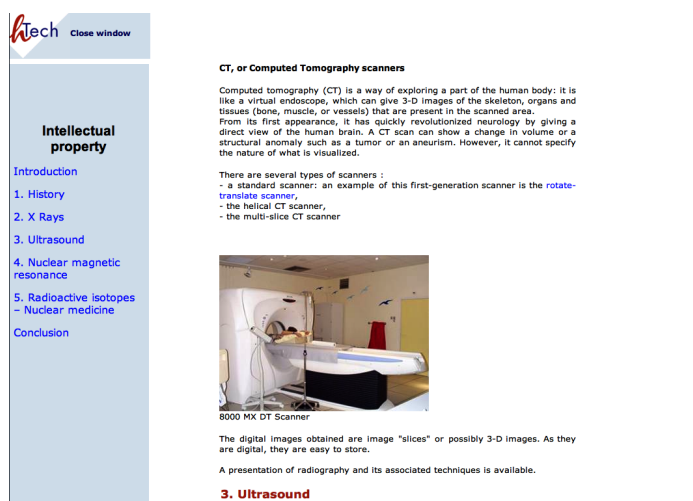


Fig. 6 - An example of the medical imaging chapter. All the documents involve many links to the Patstec web site.

In all these cases, the digital or virtual helps bring a human dimension to these objects, these artificial components that are naturally inanimate, austere and often obscure. Virtual elements are an indispensable addition to real objects and exhibitions.

Conclusion

In general, what we call heritage is looked upon as a testimony to the past, be it precious, magnificent or imposing. But in the case of the technological innovations of the last sixty years, the material artifacts are often unattractive, hard to interpret, or encapsulated within a 'black box'. This is why the immaterial side of this story, which can be used as a complement to the actual objects, is so important, as it represents the human dimension of these innovations in terms of imagination, creativity, strategy and interdisciplinary co-operation.

Certainly we are aware that bringing value and exhibitions to the preserved items and collections should be done with a minimum of fixed boundaries, to encourage diversity, aesthetics and efficiency.

Such projects require rigorous rules and standards and coordination. With this in mind, we have worked tirelessly for the last 10 years on numerous preservation experiments, as part of an international effort to preserve this valuable heritage.

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Contact

Yves Thomas

Professor at IHT-Polytech, University of Nantes

Address: rue Christian Pauc, BP 50609, 44306 Nantes Cedex 3, France

E-mail: yves.thomas(at)univ-nantes.fr

Catherine Cuenca

Chief Curator at IHT-Polytech, University of Nantes

Address: rue Christian Pauc, BP 50609, 44306 Nantes Cedex 3, France

Musée des arts et métiers – Cnam

Address: 292, rue Saint-Martin, 75003 Paris, France

E-mail: catherine.cuenca(at)cnam.fr; catherine.cuenca(at)univ-nantes.fr

www.patstec.fr

Supporting interdisciplinary teaching and research with the Museum of Anthropology's Online Artifact Database

STEPHEN WHITTINGTON, KYLE BRYNER, BEVERLYE HANCOCK & TINA SMITH

Abstract

We present a case study of how the Museum of Anthropology at Wake Forest University developed and implemented a database system and online information service to promote and preserve its collections and make information contained within its digital database freely accessible. The Museum of Anthropology received three Museums for America grants from the Institute of Library and Museum Services to address high-priority collections stewardship activities aimed at maintaining and improving the management of archaeological, ethnographic, and archival collections to fulfill its educational mission and strategic goals. The overall objective of the three-phase project is to provide broad public access to cataloging information and digital images for all objects and archival records in the collections through the web. As part of the project, we utilize methods to engage visual learners. We work with faculty members and primary and secondary school educators to introduce the teaching and research potential of the Museum of Anthropology's Online Artifact Database; provide ideas for integrating museum objects into teaching and learning; and offer strategies for generating interdisciplinary thinking.

Introduction

University museums are confronted with the need and opportunity to present their collections in new and innovative ways to the public. One means of developing new audiences and presenting more information to current audiences is to develop web content and digital resources. Web content and digitization perform multiple functions for museums. Digitization provides an easier means to organize, sort, and search information about collections, but also provides a means to preserve information (DREWES & PAGE 1997). Utilization of custom-made database management programs allows museums to input and manipulate large amounts of data, including text and digital images, in an efficient and easily accessible manner. The following is a case study of how one university museum developed and implemented a database system and online information service to support research and teaching at multiple levels.

Museum of Anthropology

The Museum of Anthropology at Wake Forest University creates awareness of global cultures by collecting, protecting, managing, and exhibiting archaeological artifacts, ethnographic objects, and visual arts of past and present peoples, and providing opportunities for intercultural learning.

Founded in 1963, the Museum of Anthropology was established by the faculty of the Department of Anthropology to broaden learning opportunities for students. Since its inception, the museum's educational role has expanded greatly within the Winston-Salem and Piedmont Triad communities, to the extent that we are 'Winston-Salem's global cultures center'. The museum's collections, exhibits, and educational programs have grown extensively.

Collections

The Museum of Anthropology's collections of some 28,000 archaeological and ethnographic objects represent ancient and contemporary traditional non-Western cultures from around the world. No other museum in North Carolina collects from such a diversity of world areas, past and present. The first and only exposure many people have to these cultures is through exhibits and outreach programs

based on the museum's collections of stone tools, wooden masks, woven textiles, metal adornments, ceramic vessels, and other objects. Subsets of the collections reveal important facets of the history of the area's Moravian community and the early development of archaeology in North Carolina not available elsewhere. The collections are used for teaching university and K-12 students, in public outreach, for long-term exhibits and for loans to other institutions, and are the basis of scholarly publications and academic theses.

Archaeological Objects

The archaeological collection consists primarily of 20,517 artifacts collected in the 1930s and 1940s by Douglas Rights, a founder of the North Carolina Archaeological Society and a Moravian minister. Most artifacts in his collection came from the Western Piedmont and Yadkin-Pee Dee River basin of North Carolina and represent the Archaic and Woodland peoples of this area. There are 1,150 objects from the Americas south of the United States. In addition, there are 1,205 objects from Europe, North America, Africa, and unknown locations.

Ethnographic Objects

The ethnographic collection of 5,106 objects represents cultures located throughout most of the non-Western world. Museum staff members, Department of Anthropology faculty and students, and private individuals collected many objects within their cultures of origin and documented their significance. The largest single ethnographic collection is from Africa, consisting of 1,474 objects. Significant portions of the 1,121 objects from Mexico, Central America, and South America consist of Maya textiles from the 1970s to the present, objects used in Día de los Muertos celebrations in Mexico, and Amazonian personal adornment from Brazil. The collection includes 1,239 objects from Asia: 654 late Q'ing dynasty items from China, 180 objects from Japan, and the remainder from scattered areas of Southeast Asia. There are 426 ethnographic objects from North America, including Yup'ik and Inuit materials collected by Moravian missionaries in Alaska and Labrador. Oceanic artifacts made by many island peoples, particularly those of New Guinea, number 527. The remaining items are from Australia, northern Pakistan, India, the Middle East, and unknown areas.

Archives

The archival collection consists of almost 7,000 paper documents, printed photographs, slides, and negatives that relate to and support the object collections. Generally, the materials in the archives were created by the collectors of the objects and record information that makes the function and significance of the objects more comprehensible to people not familiar with the cultures from which they came. As with the objects, many of the archival documents and images record information about life-ways that are no longer practiced and cultures that are changing rapidly under the effects of globalization. The archives contain irreplaceable information about cultural and environmental contexts of our collections of objects from past, changing, and modernizing cultures.

Development of the digital database

Until 2005, the Museum of Anthropology had no registrar or collections manager and creation of paper and computer database records fell to staff and students when they could spare time from their regular duties. Distractions and inadequate training led to many errors and inconsistencies in both physical and digital records. Few objects were photographed.

In addition, due to a history of trying several data management programs, all developed primarily for business applications and designed in-house for financial reasons, digital records did not have consistent lexicon categorization and some data from physical records were not in the computer

catalog because of insufficient field space. The museum eventually settled on Access for digital records, but the database was designed and installed by a person who was knowledgeable about neither the program nor the museum's needs. It was in spreadsheet format, with fields not logically ordered for efficiency of data entry or retrieval. Search, select, sort, and copy manipulations were inefficient and frequently did not function as intended. The extended spreadsheet form was awkward and time-consuming to navigate for retrieving information.

The staff attempted to complete and clean up the Access catalog, but progress was slow and the collections and related research had grown to the extent that the system did not meet data management needs. Finally, we decided that having a data management program designed for museums would, at last, bring order and consistency to the management of collections and allow enough room for complete data recording. Having the catalog consistent and up to date would permit the staff to focus on current registration and cataloging duties, facilitate access to and use of collections, and reduce staff time, effort, and wear on collections.

Phase 1

A grant from the Museums for American program of the Institute of Museum and Library Services (IMLS) funded phase 1 of the digital database project, which ran from October 1, 2004 to April 30, 2006. The purpose of phase 1 was to create a new computerized database of the Museum of Anthropology's collections of archaeological and ethnographic objects so that the staff and public could access useful and accurate records of all objects quickly and effectively.

Visual Re:discovery is a relational database that presents basic data in a catalog card format visible on one screen, facilitating rapid access and retrieval. In addition to collections management and photograph management modules, a lexicon module assists with consistency of field terms so that indexing and retrieval will be complete with no items omitted due to improper terminology.

We installed the new database and migrated data onto a server at Wake Forest University. The newly-hired registrar input new records into the database and corrected migrated records. Working with Re:discovery database records proceeded much more rapidly than anticipated. In general, we were pleased with Re:discovery as a database management tool for museum staff use. Searches were thorough and records were detailed and helpful.

We installed a public-access computer terminal with connection to the database in a museum gallery and guided members of the public and Wake Forest University students in use of the database for research and course support. However, this aspect of phase 1 was not a complete success. The public-access version of Re:discovery that we purchased with the support of IMLS was inflexible and search results were not visually or intellectually stimulating, which limited its appeal to the public. In addition, we installed the database on a server in a building across campus from the museum. The server handled large amounts of data, so searches were extremely slow, severely limiting appeal for researchers. Finally, we underestimated the amount of effort necessary to promote the public-access database to the public and Wake Forest University community.

Phase 2

The purpose of phase 2, funded by a second Museums for America grant, was to update the computerized database and integrate photos of objects so that the staff and public would be able to access useful and accurate records and images of all objects quickly and effectively through the World Wide Web (fig. 1). Phase 2 began August 1, 2006 and ended July 31, 2008.

During the beta-testing period late in phase 2, the public version of the database was installed on the web. Included within the database website are a research guide, online catalog manual, K-12 lesson plans, and answers to frequently asked questions to make it more user-friendly.



Fig. 1 - Museum educator Tina Smith shows elementary school student Erin Fritts an African crown and its corresponding Online Artifact Database record © Wake Forest University

Phase 3

The overall goal of phase 3, supported by a third Museums for American grant, was to provide broad public access through the web to cataloging information and digital images for the archival collection. Access to the archival collection will enhance classroom teaching and research for faculty and students at Wake Forest University and other institutions of higher learning throughout the nation; support curriculum-based learning by students in primary and secondary schools in North Carolina and other states; facilitate research into the context of traditional

material culture by scholars worldwide; and permit the general public to learn about traditions and modernization of peoples throughout the world. Project activities occurred between August 1, 2008 and July 31, 2010.

Public access is through the museum's website. Web use manuals were written for the museum staff, educators, and the public, and workshops instructed primary and secondary school educators on how to use the web archives with their students. Project staff members evaluated the project on the basis of timely completion of activities and by testing the ability of museum staff to search the web archives successfully.

Results

The Online Artifact Database¹ is accessible through the museum's website². Museum of Anthropology staff members promote the database through presentations to the public, K-12 educators, and faculty from institutions of higher learning. The public launch of the database occurred at a reception on September 9, 2008. Print media and list-serves quickly spread news about its existence and people started to explore it remotely.

The museum's staff promoted the database even before the public launch. The director and registrar demonstrated it to Wake Forest University faculty, staff, and administrators at a Teaching and Learning Fair in February 2008. As part of phase 2, the museum educator and registrar demonstrated it to K-12 teachers from the Winston-Salem/Forsyth County School District at four June 2008 workshops.

The pace of promotion activities increased after the official launch. The director and museum educator spoke about the database at meetings of Wake Forest University faculty in the departments of anthropology, art, education, health and exercise science, and history, at a special reception in the museum for faculty from any department, and at new faculty orientation. The educator presented

¹ www.wfu.edu/moa/database/ (accessed December 13, 2010).

² www.wfu.edu/moa/ (accessed December 13, 2010).

additional workshops for teachers in the Winston-Salem/Forsyth County School District at individual schools and at the district office. We solicited concrete feedback from teachers in the form of lesson plans and class activities that use the database. With permission, we plan to make any feedback we receive freely accessible to other educators through the database support pages.



Fig. 2 - Registrar and collections manager Kyle Bryner provides strategies for searching the Online Artifact Database at a workshop for faculty from local colleges and universities © Museum of Anthropology

Greensboro College, North Carolina A&T State University, and Forsyth Technical Community College left with ideas and skills related to object-based learning, using museums in the classroom, and the teaching and research potential of the database. Wake Forest University faculty members from the departments of anthropology, art, classical languages, communication, economics, education, history, romance languages, and theatre and dance attended.

We hoped many of the workshop participants would send us concrete examples of how they implemented what they learned. To encourage attendees to put what they learned into practice, each



Fig. 3 - After searching the Online Artifact Database, students from *Visualizing Empire (c. 1600 to the Present)*, a history first year seminar at Wake Forest University, work with objects and their paper records in the Museum of Anthropology's curation room © Museum of Anthropology

On February 21, 2009, the museum presented a faculty workshop entitled *Using Museums to Support Interdisciplinary Curriculum in Undergraduate Teaching* under a grant from the Provost's Fund for Academic Excellence (fig. 2). In addition to the director and registrar, presenters included Katherine Hart from the Hood Museum of Art at Dartmouth College and Carin Jacobs from the Center for Arts, Religion and Education at the Graduate Theological Union. Innate interest in the topic was augmented by a \$200 stipend to faculty members who attended. An enthusiastic group of 27 faculty members from Wake Forest University, Salem College, Guilford College,

was eligible for an additional \$200 stipend upon submission of a course syllabus and student projects that resulted from implementing methods introduced in the workshop; evidence of submitting an article to a peer-reviewed journal based on research performed using the Museum of Anthropology's Online Artifact Database; or evidence of presenting a paper at a national conference on teaching or research using the database. We will share examples through the support pages of the database itself.

Since then, workshop participants have incorporated the database into their teaching for courses in acting, anthro-

pology, education, first year seminar, history, and Spanish at Wake Forest University (fig. 3) and history at North Carolina A&T State University. Five additional Wake Forest University faculty members in the departments of anthropology, religion, and history have used the database in connection with their teaching. They did not attend the workshop and were ineligible for stipends, but heard about the database and wanted to use it anyway. So far, more than 300 university and college students have used the digital collections in their learning. Other faculty members at Wake Forest University and other colleges have indicated they plan to integrate the database into their research and teaching during coming academic years.

We have begun to shift our focus to promotion outside of Wake Forest University. Museum staff and university faculty members have presented at local, state, regional, and international museum, history, creativity, digital curation, and archaeology symposia and conferences. Two publications about the database have come out so far (WHITTINGTON ET AL. 2009; 2010).

We have directly introduced the database to approximately 1,711 K-12 educators, 234 university faculty and staff members, 415 symposium and conference attendees, and 72 members of the general public.

We track visitors to the Online Artifact Database using Google Analytics. From the database launch through the end of phase 3, the database website had 5,633 visits. There were 113,227 page views, with an average of 20.1 per visit. A visit lasted an average of 8 minutes 57 seconds. New visits accounted for 66.7% of all visits, which came from 67 countries or territories. The majority of visits came from the United States, with Canada, the United Kingdom, Australia, Germany, Mexico, the Netherlands, India, Chile, and Spain rounding out the top ten.

K-12 educators are excited by the potential of the Online Artifact Database to expand their teaching and their students' learning in new directions. Conference attendees are interested in learning how they can emulate what we have done. University and college faculty members near the beginning of their careers are the most accepting of the database and willing to incorporate it into teaching and research. Increasing acceptance of the database throughout the academy is a challenge we continue to face.

Conclusion

The three phases of this project provide the staff of the Museum of Anthropology at Wake Forest University with physical and intellectual control of our object and archival collections and permit us to fulfill our educational mission rigorously. By making the Online Artifact Database freely accessible to anyone using the web, we provide research and teaching support for our university and reach out to visual learners worldwide.

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Contact

Stephen Whittington, PhD

Director of the Museum of Anthropology

Address: Museum of Anthropology, Wake Forest University, P.O. Box 7267, Winston-Salem, NC 27109-7267, USA

E-mail: whittisl@wfu.edu

www.wfu.edu/moa/

Kyle Bryner, MA

Registrar and Collections Manager of the Museum of Anthropology

E-mail: brynerke@wfu.edu

Beverly Hancock, MA

Curator (retired) of the Museum of Anthropology

E-mail: hancocbh@wfu.edu

Tina Smith, MA

Museum Educator of the Museum of Anthropology

E-mail: smithth@wfu.edu

Old bones, digital narratives: Investigating the Peter B. Cornwall Collection in the Phoebe A. Hearst Museum

COLLEEN MORGAN, ALEXIS T. BOUTIN, SHEEL JAGANI & BENJAMIN W. PORTER

Abstract

A joint team of archaeologists from the University of California, Berkeley and Sonoma State University are examining a collection of artifacts and skeletal material excavated by Peter B. Cornwall in Bahrain and eastern Saudi Arabia in the 1940s and accessioned in the Phoebe A. Hearst Museum. Motivated by modern innovations in the examination of skeletal materials and a greater awareness of broader Near Eastern history, we are considering this collection from a contemporary bioarchaeological perspective and in terms of the personal history of Peter B. Cornwall. In this article we discuss our progress, summarizing our analytical work on the objects and human remains, as well as our plans to document our research and the collections using a number of on-line platforms.

Introduction

University museums host collections that not only provide insights into the history of archaeological inquiry, but also are of increasing interest to current research questions. Reexamination of these legacy collections within the context of a discipline that has changed tremendously within the last 70 years allows new modes of analysis to be performed on the artifacts themselves and brings forth a greater perspective of their regional importance in light of subsequent excavations. Additionally, the collections can be enhanced with forms of documentation that were not available at the time of accession. Digital photography of objects in the collections can aid the sharing of information between interested researchers across the globe. With the rise of social media, the connection between research performed in a museum and an interested public becomes immediate and publication becomes instantaneous. Our research on the Peter B. Cornwall collection in the Phoebe A. Hearst museum at the University of California, Berkeley incorporates a research design dedicated to the scientific reassessment of the collection, an inquiry into the life of the relatively little-known deaf archaeologist who was an early explorer of ancient Dilmun, the area known today as the western side of the Arabian/Persian Gulf, and the remediation of these materials online. With this study we hope to show the enormous resources available at university museums and the value of continued engagement with legacy collections.

Alexis Boutin, the project's osteologist, identified the collection within the Hearst Museum in the fall of 2008, finding entries in the card catalog listing materials from 'Arabia' and 'Bahrain Island'. A quick glance at these cards, and then at the skeletons and artifacts themselves, indicated that a substantial collection was present, certainly presenting work for more than just one person's expertise. The initial questions generated by this preview were vast: Was this collection worth scientific examination? Who was Peter B. Cornwall? Were there any stakeholders involved who would be interested in these materials?

Given the nature of these questions, it became necessary to create a collaborative, interdisciplinary team of scholars with unique talents and complementary research interests. Alexis Boutin directs the analysis of human remains while Benjamin Porter, a Hearst curator of Near Eastern archaeology, leads a team to examine the collection's stone, bone, ceramic, glass, and ivory artifacts. Joining them are Amber Zambelli, Alan Farahani, Sheel Jagani, and Bianca Brenes, undergraduate and graduate students at Sonoma State University and the University of California, Berkeley. Colleen Morgan is in charge of digital documentation and dissemination. The project also draws on the talents of Kathryn Killackey, a scientific illustrator, Jennifer Piro, a zooarchaeologist, and Athna May Porter, a

professional genealogist. Despite the differences in academic rank, the staff of the Dilmun Bioarchaeology Project (DBP hereafter) organizes itself as an egalitarian research group who encourages and appreciates each member's unique contributions to the project's collective goals.

History of the collection

With the personnel assembled, the next step was a preliminary research assessment of the Cornwall collection. The first question was to determine how the materials had been collected and eventually deposited at the Hearst. The museum's accession file and published academic literature were key resources in this regard. Through archived correspondence, we learned that beginning in 1940, Peter B. Cornwall, a graduate student at Harvard University, sought institutional affiliation and field research funding from the Hearst Museum to conduct excavations and surveys in what was broadly called 'Arabia' at that time. Although Hearst officials Alfred Kroeber, Theodore McCown, and Edward Gifford



Fig. 1 - Peter B. Cornwall's research team, lifting a limestone slab during excavations in Bahrain © Phoebe A. Hearst Museum of Anthropology

granted Cornwall institutional affiliation and professional mentorship, they did not offer him funding beyond the cost of shipping materials to California. Despite some delays due to World War II-related events, Cornwall conducted his field research in late 1940 and early 1941. After recovering the skeletal remains, Cornwall coated them with shellac while still in the field. They were then shipped to his home in Marin County, where he apparently carried out some restoration of fragmentary bones and artifacts. Upon returning to the United States, Cornwall studied many of these materials, publishing portions of the data in his 1944 PhD dissertation, *The history of Bahrain Island before Cyrus* and other scholarly and public journal articles (CORNWALL 1943, 1944, 1946a, 1946b, 1952).

According to the museum's doorbook and accession sheet, the entire collection was deposited in the Hearst Museum in December 1945, under the accession number 831. An inventory of its contents was completed in September 1949, according to a letter from the Hearst to Cornwall.¹ Some correspondence between Gifford and Cornwall suggest that Cornwall was to help unpack and inventory the materials, but this did not happen despite repeated requests. Correspondence with Cornwall about the collection ends in 1952. A trial catalogue sheet dating to September 1965 indicates that Grover Krantz, who was then a physical anthropologist employed at the Hearst, catalogued the skeletal materials. At the time of this writing, there is no record that a similar act was carried out on the objects, although we have reason to suspect that there was. Given museum protocol during the 1960s, it is likely that the catalog number was written on each object and bone at or around the same time as Krantz's work. The materials were housed in their current location after the facilities were built in 1959. Their drawers provide some information about their management by the Hearst Museum

¹ Gifford, E. W., *Letter to Cornwall*, September 28, 1949.

staff. For example, a sequential number was written on each of the drawers; at some point after this, a fresh label was stapled to each drawer. Collections managers conduct spot checks periodically to comply with pest management and security protocols. The skeletal materials were inventoried during the museum's efforts to be NAGPRA compliant during the 1980s and 1990s, although funds were not available for their osteological analysis.

The DBP's second charge was to study available documentation to define the collection's spatial and geographic parameters. According to his notes and correspondence, Cornwall excavated and surveyed in regions that once comprised the ancient polity of Dilmun, but are today the modern Kingdom of Bahrain and the eastern coast of Saudi Arabia. He obtained permissions both from local governing authorities and Standard Oil, who had oil exploration rights to some of these territories.² According to his descriptions, Cornwall surveyed several prehistoric settlements throughout central and eastern Saudi Arabia. In Bahrain, Cornwall excavated a Roman bath and thirty-five tumuli around the island. From the latter, he recovered a number of skeletons and associated objects. Cornwall also mentions that he recorded geological and environmental data during his travels. He took physical measurements on local populations as well, as he held an interest in anthropometry, the measurement of living people for the study of human variation (CORNWALL 1943, 1944, 1946b).

The group's third question about the assemblage was biographical in nature: Who was Peter Cornwall? In addition to the accession file, public documents have helped piece together his biography. Cornwall was a San Francisco Bay Area native born in 1913 to a family with deep roots and high status in northern California. Peter Cornwall attended Phillips Academy in Andover, Massachusetts and went on to study at Stanford University, the University of Toronto, and Oxford University, finally earning his bachelor of arts in 1939. At some point in his life, Cornwall lost his hearing and could only communicate through writing, and there is some evidence that this was the cause of Harvard's unwillingness to fund Cornwall's expedition.³ According to his vita, he showed an interest in Near Eastern and Mediterranean archaeology and history throughout his education, participating in excavation projects in Greece, Egypt, and Malta during the 1930s.⁴ After earning his PhD at Harvard University in 1944, Cornwall was based in the San Francisco area, traveling abroad frequently. In 1952, he reports that he is moving his residence to Rome, near the American Academy.⁵ According to cemetery records, Cornwall died in Rome in 1972 at age of 59. His body was shipped back to the family cemetery near Palo Alto, CA. At the moment, nothing is known of Cornwall's activities in the last two decades of his life. Records suggest he never had children and our attempts to identify Cornwall's living relatives have thus far been unsuccessful.

Collections work

Finally, there was the collection itself to consider. The DBP's preliminary research assessment of the objects determined that they are well preserved, in part due to the Hearst Museum's excellent management strategies. Cornwall appears to have performed object restoration when possible. Other specimens are fragmentary, as is common for excavated materials. The collection contains objects made from several materials, including metal, bone, ivory, pearl, shell, and alabaster, although stone and ceramic are the dominant material types. Representative forms include vessels, jewelry, and tools. We are collecting non-destructive descriptive data (e.g. dimensions, color, condition). Many of these objects have been photographed and drawn for an upcoming publication. Comparing these objects to examples already published in the secondary literature has helped provide relative dates for

² Cornwall, P.B., *Letters to Theodore McCown* dating November 28, 1940, January 7, 1941, February 8, 1941, and May 15, 1941.

³ Coon, C.S., *Letter to Theodore McCown*, March 20, 1940.

⁴ Cornwall, P.B., *Letter to Theodore McCown*, March 26, 1940.

⁵ Cornwall, P.B., *Letter to Theodore McCown*, March 21, 1952.



Fig. 2 - Artifacts excavated by Cornwall in Bahrain, which are currently housed at the Hearst Museum © Phoebe A. Hearst Museum of Anthropology

the artifacts. So far, the team has determined that several different time periods are represented, the oldest being Paleolithic or Neolithic, with the youngest material dating to the tenth century CE. The objects excavated from tumuli provide relative dates from the late third millennium BCE to the end of the first millennium CE.

The preliminary assessment of the human remains revealed approximately 24 burial features: one jar burial, two features in a small cemetery, and 21 tumuli. The remains of at least 32 individuals are present. Twenty of the burial features appear to have been single interments, with three double burials, and two multiple burials. Inventory data have been used to estimate the completeness of the 32

skeletons. Overall, 34.4% of the skeletons were mostly complete, 12.5% were fairly complete, and 53.1% were fragmentary. Although the proportion of mostly complete skeletons may seem low, we observed further that the majority of this group was very well preserved, with major bones and diagnostic features intact. Preliminary estimates of sex suggest ten possible/probable males and six possible/probable females. An age assessment of twenty-eight individuals revealed 20 adults, three adolescents, two children, and three infants. Several pathologies are exhibited at significant frequencies, including ante mortem tooth loss, osteoarthritis, and Schmorl's nodes resulting from compression of the vertebral column. A handful of isolated pathological conditions also require further study, which include an apparent healed depressed fracture of the cranium, a possible traumatic injury to the humerus, and a congenital growth defect.

Documentation and dissemination

One of the DBP's main goals is to increase the transparency of the archaeological process. To be successful, therefore, the project has organized a documentation and dissemination team that uses different technologies to record our research. Documentation takes several forms, from written to digital, from notebooks to databases and video. During the research assessment, the team piloted several projects using inexpensive or free resources. Digital photographs of all analyzed objects and some skeletal materials were taken and archived. Free, online digital software including Google Docs and Picasa allowed team members to share their work and communicate between research groups.⁶ Video documentation was taken of the objects group 'at work' and was edited into a short video 'webisode' that will be made available for a public audience.

Also, a project website with a blog was established at bbproject.wordpress.com. So far, posts to the blog have included profiles of team members, progress reports on skeletal analysis, and abstracts submitted to scholarly conferences. Through this blog we provide updates on the ongoing progress in

⁶ Permission to photograph and use these images for research purposes was granted by the Hearst Museum.

our research at the museum and our preliminary publications – including the abstract that we submitted for the 2009 UMAC International Conference. We have also drafted an ethics statement regarding the display and remediation of human remains to guide us through our research process and to clarify our intentions to public audiences. We have shared this information in hopes of soliciting feedback from interested readers. In what can be seen as a success of this practice of sharing research outcomes, the ethics statement has been used in archaeological ethics classes in universities outside our home institutions. Although it is a work-in-progress, it outlines our intentions and we hope it will provide a model for future practice.

Upcoming activities

We want to make our research a public enterprise, visible to possible stakeholders as well as to other researchers with similar interests. To this end, using the object data we have captured digitally, we have begun a series of online outreach projects that show our evolving research in a variety of venues. The central hub for this outreach is our aforementioned blog, which hosts links, images, and commentary related to our project. We plan to seek permission to host a selection of images taken at the museum of artifacts and of the research team working on artifacts on Flickr and linked to the blog for review. These digital images are standard archival shots, catalogued with their metadata and enhanced with commentary from the research team.

Hosting archaeological images on a social networking site like Flickr would allow us to tag the photographs and to annotate certain aspects of the image that would not be obvious to the non-specialist. Placing the images in the public's path also allows for commentary and questions – a strategy that has been used with great effect by the Library of Congress⁷ and other institutions that use Flickr for outreach (SPRINGER ET AL. 2008). Additionally, we are documenting our research in the museum with digital video and have uploaded a short introduction of the project to Youtube. Video recording is a time-consuming yet effective way to communicate archaeological ideas to the public, and the 2–3 minute format popularized on Youtube is concise and easy to manage. Combined, these online resources will provide access to the collection, our research methods, artifacts and to the project team.



Fig. 3 - Dr Benjamin Porter of the DBP research team, analyzing artifacts in the Hearst Museum – Photo: Colleen Morgan, with permission from the Hearst Museum

The DBP also has an interest in interpretive accessibility. Three skulls from the Cornwall collection are prime candidates for facial reconstruction, based on their excellent preservation. These include a young adult male, a possibly male adult, and a young adolescent. Facial reconstruction of selected well-preserved skulls from the Bahraini tumuli will “flesh out” our explorations of these

embodied persons. Each reconstructed face's final appearance will be informed reflexively by

⁷ See www.flickr.com/photos/library_of_congress/ (accessed December 13, 2009).

historical and iconographic data from its contemporary society (e.g., hairstyle, costume) and lifestyle information from the individual himself (e.g., age at death, pathologies, markers of occupational stress) (KUSTÁR 1999; PRAG & NEAVE 1997; WILKINSON & NEAVE 2003). Facial reconstruction is a particularly effective tool for outreach to public audiences. By “putting a face” on the ancient people of Dilmun in a way that is much more vivid and tangible to the island’s modern residents than a skull or stylized drawings, such facial reconstructions can facilitate indigenous peoples’ pride in their physical identity and cultural heritage (ROSE 2000).

The completeness and preservation of many skeletons in the Cornwall collection make them well-suited to interpretation by means of fictive osteobiographical narratives. This style of writing permits humanistic, experiential evaluations of skeletal data that are contextualized with all available archaeological, textual, and iconographic information. Consistent with our aim to disseminate our research findings widely and in an accessible fashion, fictive narratives can be more comprehensible and interesting to the public than traditional anthropological reports. They are also written in a way that makes transparent the contingency and collaboration that are inherent to the production of archaeological knowledge.

We plan to disseminate our findings to various interested publics through several channels. We will start updating our blog regularly with status updates on object and skeletal analysis, as well as photographs and webisodes of the teams at work. At later stages of the project, we envision incorporating the osteobiographies described above, as well as a database of objects and skeletal remains. Translation of parts of the blog into Arabic, so that it is accessible to Middle Eastern audiences, is another goal of the project. Aspects of the DBP’s research findings will be published in peer-reviewed journals and a forthcoming final report.

Conclusion

Peter Cornwall doubtless had the best of scholarly intentions when he excavated skeletons and collected objects from Bahrain and eastern Saudi Arabia. Many of these intentions were fulfilled by his insightful analyses and publications. Yet the full research potential of many of the objects and all of the human skeletons remained untapped as they sat, well cared for but unanalyzed, in the Hearst Museum’s collections for the past half-century. Through a fortunate coincidence of factors, the DBP has coalesced, bringing with it our interests, resources, and abilities, to complete the process begun by Cornwall. We are fortunate to have university museums such as the Hearst – important repositories of knowledge – available to us for research and interpretation.

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Contact

Colleen Morgan

PhD Candidate

Address: Department of Anthropology, University of California, Berkeley, Berkeley, CA 94720, USA

E-mail: [clmorgan\(at\)gmail.com](mailto:clmorgan(at)gmail.com)

Alexis T. Boutin, PhD

Assistant Professor

Address: Department of Anthropology, Stevenson 2054A, Sonoma State University, 1801 E. Cotati Ave., Rohnert Park, CA 94928, USA

E-mail: [boutin\(at\)sonoma.edu](mailto:boutin(at)sonoma.edu)

Sheel Jagani

Student, University of California, Berkeley

E-mail: [saj\(at\)berkeley.edu](mailto:saj(at)berkeley.edu)

Benjamin W. Porter, PhD

Assistant Professor of Near Eastern archaeology, Curator of Near Eastern archaeology, PA Hearst Museum of Anthropology

Address: University of California, Berkeley, Near Eastern Studies Department, 240 Barrows Hall, #1940, Berkeley, CA 94720 – 1940, USA

E-mail: [bwporter\(at\)berkeley.edu](mailto:bwporter(at)berkeley.edu)

From anatomy to zoology: Results on the history of university collections based on trans-disciplinary research

CORNELIA WEBER

Abstract

The majority of research projects on the history of university collections are focused on a single collection or on collections of one discipline. Trans-disciplinary studies, however, despite opening up a different and more rewarding view on university collections, remain very rare.

This article, drawing on results from trans-disciplinary research on university collections in Germany, gives new insights into the history of the origin(s) of collections and academic knowledge formation, as well as into the relevance of collections for the development of different disciplines.

Introduction

In recent years, research on material culture and its role in the history of science and knowledge history has received increasing attention (FINDLEN 1996; ZWECKBRONNER 1999; BRENNI 2000; TE HEESSEN & SPARY 2001). Related to this, research on university collections has greatly advanced as well. To provide only one example: Since 2004, the German Research Foundation has been funding *University collections in Germany: Research on their holdings and history*,¹ a project through which the Helmholtz Centre for Kulturtechniken intends to catalogue German universities' collections and compile data on their holdings and history. Now, after almost five years of work, the inventory is more or less complete, so that the material published in the online database makes possible specific investigations into the history of science and historical analyses of collecting.

Comprehensive knowledge on the history of our collections is crucial if we aim to successfully run university collections or museums. Their histories tell us why collections exist; for which particular purposes they were and have been founded; which relations they had and have with other collections and disciplines; and what their value for the university as an institution has been (LOURENÇO 2005). Knowledge of the particular histories and meanings of university collections helps to understand and elaborate the difference between university museums and regular museums. It is only against the background of this understanding that we can become able to confront the challenges the present holds for us.

Therefore, it is necessary to conduct an overarching historical and epistemological analysis of university collections and disciplines. Up to date, however, the majority of research projects on this topic are focused on a single collection or on collections of one discipline. Although trans-disciplinary studies open up a different and more rewarding view on university collections, they remain very rare. Our database, and the material on university collections in Germany it makes accessible, fundamentally widens the possibilities of trans-disciplinary research in this area of study. With its aid, we can more extensively learn about the relevance of the collections for the development of different disciplines and – related to this – the success or failure of different types of collections.

This article presents selected results from my research on university collections – not just in order to provide some basic insights into the history of collections, but also in order to encourage colleagues from other countries to initiate similar trans-disciplinary studies.

¹ See publicus.culture.hu-berlin.de/sammlungen/ (accessed November 25, 2009).

The relevance of collections for the development of different disciplines

In order to study the historical relationship of academic disciplines with university collections and the particular relevance of collections for the development of disciplines from a trans-disciplinary perspective, it is necessary to take a closer look at the various roles filled by research and teaching collections. Only then can their functions for the different fields be determined. For this purpose, I suggest the use of the following classification:

1. The collection as a primary material basis for research and teaching;
2. The collection as laboratory;
3. The collection as a permanent academic teaching facility;
4. The thematic collection established to support teaching;
5. The historical collection as a resource for specific scientific investigations.

These categories are, of course, not mutually exclusive. On the contrary: a collection's particular use is dependent on research methods and research questions and occasionally also on didactic concepts and can thus obviously vary in time. In the following, these five categories will be illustrated with the help of concrete examples.

Collections as primary material bases of teaching and research

The first academic teaching subject to include practical demonstrations into its curriculum was anatomy (RICHTER 1977, 6). Its "modernizer" was Andreas Vesal (1514–1564), a doctor and anatomist based in Padua, who insisted that university teachers personally dissect and use corpses when demonstrating anatomical facts. Thus, course offers in winter terms included anatomical preparations and demonstrations.

In this way, anatomy gradually evolved from a traditional book science into an experimental natural science. Dissections allowed scholars to extract collection objects which then served the students' academic as well as practical education. As a result, anatomical cabinets were gradually established in medical faculties.

Principally, the establishment of extensive collections of demonstration objects was decisive for the direction the development of a discipline took. The specimens, however, served not only as demonstration objects, but were also made available for research and provided, for example, the basis for innumerable dissertations and other works (SCHULTKA & GÖBEL 2007, 46–47). Thus, for anatomy's formation and development, the existence of specimen collections was essential: they provided the working basis for teaching and research activities. The same is valid for many medical and veterinary subjects such as pathology, medical anthropology, surgery, gynecology or orthopedics, and beyond them for all subjects of the natural sciences such as botany, zoology, forestry, paleontology, geology, and mineralogy. While today's collections only play a minor role for teaching and research in medical subjects, their importance for the natural sciences remains marked: they serve as archives uninfluenced by current research agendas and scientific trends.

While it is also established that universities provide the materials necessary for teaching and research, this was not always the case. In earlier times, the collections used at universities were usually privately owned, since for the most part university teachers were personally responsible for acquiring and maintaining their equipment for teaching and research (MÜLLER 2006, 146). This practice, however, shifted during the second half of the 18th century, when the University of Göttingen installed Germany's first Academic Museum in 1773 and provided the most essential instruments for teaching and research. From then on, universities systematically bought private collections in order to ensure that all necessary materials and instruments were made available.

Questions regarding the transition from private to institutional collection practices are important for understanding the conceptualization of collections in the past. For it was only with the decision of German state governments to financially assist academic teaching and research that systematic institutional and material infrastructures were established. They, in turn, were a prerequisite for the development and elaboration of planned collection strategies.

Collections as laboratories

Germany's, possibly even Europe's first 'Royal Academic Museum' was founded in 1773 by the University of Göttingen (LICHTENBERG 1779, 48). It consisted mainly of two sections. The first held natural objects; the second focused on the arts. Until into the 1840s, the individual segments of the collection formed one spatial and organizational unit (PLESKER 2006, 261). Following the expansion and specialization of academic disciplines, however, collections were gradually reaffiliated with their newly institutionalized faculties.

The museum, which was jointly directed by Johann Friedrich Blumenbach (1752–1840) and Christian Gottlob Heyne (1729–1812) (MARINO 1995, 9), held collections from the natural sciences – among them botanical, zoological and geological collections – as well as coins, art and ethnographical objects (LICHTENBERG 1779).

Objects from the collections were not only employed as demonstration material for teaching, but were generally accessible to students and academics of all faculties for personal study (PLESKER 2006, 273). Collections were thus used as 'laboratories' for the study, comparison and analysis of objects.

While we are unable to reconstruct any specific impulses the objects may have inspired, we can surely assume that, as 'laboratories', academic collections played an important role in the emergence and formation of disciplines.

Collections as permanent academic teaching facilities

Especially among the cultural studies, there are disciplines which depend on their teaching collections. Let us take a closer look at archaeology: As an academic teaching subject in Germany it was founded by Christian Gottlob Heyne (see above), who was library director and professor of poetry and eloquence at the Georgia Augusta in Göttingen. From 1767 onwards, he offered regular lectures on archaeology and the fine arts in addition to the canonical lectures on antiquities and the authors of the classical period. For these new lectures, Heyne set out to establish a collection of plaster casts with famous works of classical sculpture (GRAEPLER & MIGL 2007, 7).

Beginning in the late 18th century and following Heyne's example, other universities subsequently also introduced archaeological lectures. When Heyne's successor Friedrich Gottlieb Welcker (1784–1868) left Göttingen to continue his career at the newly founded University of Bonn, his faculty also established an academic teaching collection and institutionalized it as an academic art museum (MIELSCH 2003). Yet in contrast to Göttingen, where the casts were loosely arranged and displayed across the library, Bonn was the first university to found a museal teaching institution for the classical arts.

Even today, all universities continue to ground their teaching in classical archaeology on academic collections. The same goes for other archaeological subjects, where academic teaching is equally dependent on the existence and availability of permanent collections: prehistoric archaeology, Egyptology, the archaeology of the Sudan, the archaeology of the Ancient Near East and Christian archaeology.

Numismatics is another case in point. The presumably first numismatic teaching collection affiliated with a German university was founded in Halle in 1768 by the polyhistor Johann Heinrich Schulze (1687–1744), whose collection of classical coins provided the academic collection's initial material basis. Using his collection, Schulze held a colloquium on the science of coins in 1738, and thus essentially founded numismatics as an academic discipline (KAISER & VÖLKER 1980).

Botanical gardens, too, are important teaching institutions. At the time the first university gardens were founded, botany had not yet become an independent science; it was taught by medical scientists who trained students in the knowledge of medicinal herbs. This explains why early university gardens were founded as a 'hortus medicus' which had the function of supplying medical students with material for study. In recent years, unfortunately, botanical gardens have dramatically lost much of their significance for teaching, not least due to the rise of micro- and molecular biology.

Temporary thematic teaching collections

We know of many teaching collections with specific foci that were established with the foundation of a discipline or an academic chair, and which at least in their initial phase significantly contributed to student education. Their use was determined by the currency of the subject and therefore temporally limited. Among them were many model collections. In some disciplines, the application of models documents the shift away from theoretical and towards practically oriented teaching. This is particularly true for cameralism, a former German science of administration. One of those to methodically integrate model collections into his courses was Johann Beckmann (1739–1811), a professor at the University of Göttingen and founder of the discipline of scientific technology (BECKERT 1983). In 1777, he published the discipline's first textbook (BECKMANN 1777). To illustrate his theories during lectures, he employed three-dimensional models which not only highlighted the spatial arrangement and construction of each component, but also its respective motions. Apart from using his private collection, which counted 87 economic and technical models, Beckmann also made use of the university's model chamber collection for teaching purposes (BEHRE 1999). Its inventory today, unfortunately, only counts a remaining 20 models; numerous other model collections, however, have been permanently lost or have to this date not been retrieved. In this respect, our research has established that models were intensively employed above all in technical subjects, but also play(ed) an important role in the teaching of mathematics and medicine.

Historical collections as sources of specific scientific research

Universities obviously also hold many collections which are no longer perceived relevant for regular teaching and research activities. We consider them historical collections. A suiting example is the collection of physical apparatuses at the University of Göttingen. It was founded in 1783 by Georg Christoph Lichtenberg (1742–1799), who financed its establishment by private means (BEUERMANN & MINNIGERODE 2001, 183).

Lichtenberg's introductory lectures to experimental physics had their very own highlights: the demonstration objects. His collection was sold to the university in 1789 but remained in Lichtenberg's private apartment, where he continued to use it for research and demonstration purposes.

Similar collections documenting the historical development of a discipline are extraordinarily significant, since they provide sources for research on the history of science and thus, in time, themselves become objects of study. There are, of course, cases in which, through new research methods or approaches, a prominent collection is reopened for use within its discipline. Meckel's anatomical collections in Halle, for instance, are currently being put to use for research on historical illnesses – with the aid of DNA analyses.

Final remarks

Trans-disciplinary research, to sum up, illuminates how university collections are generally significant for the emergence and consolidation of scientific disciplines. It is not enough, however, to approach the topic with extensive knowledge on academic collections alone. On the contrary: If observations concerning individual collections are to be integrated and interpreted correctly, a project such as the *University collections in Germany* – a project promising new insights for the histories of science and collecting – demands intense cooperation with scientists and historians.

Taking into overall account the historical development of collections, it becomes clear that new research methods and approaches, or didactic concepts, can revive holdings whose value today is obviously historical, and give them renewed significance for their disciplines.

With this brief overview, I hope to have indicated the turns future research can take. Crossing the established borders of languages and disciplines will enable us to analyze and compare individual situations and issues more thoroughly. Greater insight into the history and nature of our collections will unquestionably create awareness for their unique character. Beyond this, we need to identify the qualities and characteristics that distinguish university museums from regular museums. Only then can we develop independent concepts which enable us to essentially increase academic as well as public recognition for our collections.

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Contact

Dr Cornelia Weber
General Manager
Helmholtz Center for Kulturtechniken
Humboldt University of Berlin
Address: Unter den Linden 6, 10099 Berlin, Germany
E-mail: [weber\(at\)mathematik.hu-berlin.de](mailto:weber(at)mathematik.hu-berlin.de)
www.kulturtechnik.hu-berlin.de/weber/engl

The use of collections in research and teaching at the Museum of Texas Tech University

NICOLA LADKIN, EILEEN JOHNSON, ROBERT J. BAKER & SANKAR CHATTERJEE

Abstract

Texas Tech University, located in Lubbock, Texas, is a multi-disciplinary institution conducting research and offering degrees in a multitude of academic, technological, and vocational fields. The museum supports the research and teaching mission of the university by preserving in its collections unique items of artistic, scientific, historic, and technological importance and protecting them for current and future research purposes. Museum science and heritage management students translate collections management concepts learned in the classroom into collections management practices within the Quaternary collections. The genetic resources collection provides resource material for use in both traditional and emerging research methodologies. The vertebrate paleontology collections are used in research, teaching and exhibits to generate and disseminate information for both academic and public audiences. These examples clearly demonstrate the value of the museum's collections in supporting the university's mission across disciplines and into the future.

Introduction

Texas Technological College, located in Lubbock, Texas, USA, was founded in the early 20th century to provide education in the production and manufacturing techniques important for the economic development of Texas. The Museum of Texas Tech University was founded soon after, in collaboration with local and regional organizations, to bring cultural enrichment to the university and its communities and to support their development. Now Texas Tech University, it is a multi-disciplinary institution conducting research and offering degrees in a multitude of academic, technological, and vocational fields. The Graduate School strives to maintain the flexibility and diversity that were embodied in the institution from the time of its founding, through a combination of choices from the traditional degree programs to interdisciplinary, multi-disciplinary, and vocational options (TEXAS TECH UNIVERSITY 2008). To support this interdisciplinary research, some sixty specialized research centers and institutes are located at Texas Tech University, including the Museum of Texas Tech University. The museum today is a major research and collecting institution in its own right, curating approximately two million items. The museum supports the research mission of the university by preserving in its collections unique items of artistic, scientific, historic, and technological importance, protecting them for current and future research purposes.

The Museum of Texas Tech University is an American Association of Museums accredited general university museum. It is an educational scientific, cultural, and research element of Texas Tech University. The mission statement articulates that the Museum of Texas Tech University, as an education resource for a diverse audience, collects, researches, and disseminates information about the natural and cultural heritage of local and related regions. The museum's collections, exhibitions, programming, and research compliment the diverse interests of Texas Tech University and its role in public and professional education in local, state, national, and international communities (MUSEUM OF TEXAS TECH UNIVERSITY 2005).

The museum's purpose is to support the academic and intellectual mission of Texas Tech University through the collection, preservation, documentation, and research of scientific and cultural material and to disseminate information about those collections and their scientific and cultural topics through exhibition, interpretation, and publication for primary, secondary, and higher education students, the scholarly community, and the general public (MUSEUM OF TEXAS TECH UNIVERSITY 2005). Housed

within the museum, the Center for Advanced Study (CFAS) of Museum Science and Heritage Management's mission is to prepare graduate students for entry into the international community of active professionals by providing both theoretical and practical preparation and acting as a responsible academic element of Texas Tech University. The unique value, then, that the museum provides to the university is its ability to unite the academic, professional, and public communities under one roof and to provide a connection between "gown and town" that is accessible to all. It achieves this through its collections that are developed, managed, and conserved for use in research, exhibits, and education programs for public and academic audiences, and through the education and training of future academicians and professional practitioners.

Collections are curated in the six curatorial divisions of art, anthropology, ethnology and textiles, paleontology, history and natural sciences. Research and teaching are an integral activity in all the curatorial divisions. To illustrate such activity in detail, following are three specific examples from the divisions of anthropology, natural sciences, and paleontology.

Research and teaching within the larger framework of collections accountability

Research and teaching within the museum's collections is a matter of course. Research may be studying the collections but also investigating ways to preserve and manage collections better. A major advantage of having a graduate program based at and integrated into the museum is the immersion students receive in that critical interface of theory and practice. What is taught in the classroom is carried out in the daily operations of the museum, and for our purposes here, particularly so in the collections. Students are educated in the classroom and that education is enhanced and enforced through practical training, working with the collections governed by the museum's collection management policy and manual on collections management procedures.

The collections management course and the Quaternary collections are a case in point in illustrating the interface of teaching and research with collections accountability activities on a daily basis. The Quaternary collections primarily are generated through in-house research, a longstanding tradition since the museum was founded. [Collections accountability in general involves acquisition, documentation, care, exhibition, and disposal. The focus in the daily activities is on the first three aspects – acquisition, documentation, and care.] The collections management course addresses accountability, the laws and ethics of collecting, as well as the care and control of collections. These concepts are translated into the collections management practices in which the graduate students participate with the Quaternary collections.

Experiential learning is an important aspect in the education and training of museum professionals in the museum science program. Our students, however, are not limited to museum science, but come from across campus disciplines. Experiential learning also enhances their education and they are exposed to the same translation of concepts into practices. Experiential learning begins with the course labs, such as the one dealing with preservation maintenance of outdoor sculpture. The barcoding lab is reinforced through working with the barcoding system in the collections. Practicums are another avenue where students work with real collection problems and issues towards resolution. Lastly, workshops focus on a particular issue that provides students with greater exposure and can translate into applying new skills in carrying out collections activities.

Experiential learning is extended to research and its interface with collections accountability. Student research in collections management focuses on exploring ways to care for the collections better and bring greater control. As examples, a study done in the early 1980s looked at Polyvinyl acetate (PVAC) solutions of different viscosities as a basecoat in labeling pottery to determine the most appropriate solution. A more recent one examined different percentages and viscosities of PVAC

solutions and calcium carbonate to provide mechanical strength to fragile bone. Current research involves monitoring light, temperature, and humidity levels using an electronic data logger (HOB0) within our cabinets to determine: 1) if, indeed, the cabinets are light-tight; and 2) what level of protection is afforded when fluctuations occur in the collections room.

Generating collections is focused on field-generation through research. Major acquisition issues and ensuring legality are examined. Tying back to acquisitions and collections accountability, the first concerns are the laws and ethics governing the work, followed by how well the potential collection fits the museum's and division's scope of collections and collections plan. If the site or locality is on private land, do we have landowner permission to be on the land and to conduct the fieldwork? Has the landowner agreed to donate the collection to the museum? If the research is on public or tribal land, what permit is required and is that permit in order? Is the museum named as the curatorial facility to hold-in-trust that collection? A held-in-trust collection is one that has federal, tribal, or state ownership but the museum has stewardship of the collection. The accessions inventory is an important part of the legal transfer of the collection, whether it is part of a deed of gift to be signed by the landowner or an accessions agreement to be signed by a governmental agency representative for a held-in-trust collection.

Documentation and care within collections accountability come to the forefront in field-generating collections, with the mantra that good collections management begins in the field. Both documentary control and initial field preservation as warranted are stressed, including various museum forms to record not only provenience data and photo logs but also initial inventories, field treatments, and field transfer forms. Object barcodes can be assigned in the field and then are used to track the object throughout its life history in the collection. Field preservation stresses reversible treatments and approaches that do not damage the integrity of the object. Field jacketing is a good example. This is a time-honored approach to removing something fragile back to the lab where it can be exposed in more controlled conditions. However, the older use of highly acidic papers and other products or the use of foams in place of plaster have adversely impacted object integrity. While quick in the field, such methods can have disastrous results later. Following conservation principles, changing to the use of archival products and distilled water creates a neutral buffer rather than an acidic one surrounding the fragile object.

That critical interface of theory and practice, of teaching and research with collections accountability activities is brought together for students in professional presentations at museum and academic conferences and publications in museum journals. These endeavors provide opportunities whether students are in museum science or in other campus disciplines. These types of presentations and publications highlight what they have learned and incorporated into their mind-set and skill-set, contribute to their growing professionalism, and enhance the educational and research value of the museum's collections. In turn, research and teaching is intertwined with collections activities and that synergy underscores the relevance of a university museum to academic, museum, and public communities.

Collections of mammals and genetic resources as a research resource

The natural science collection at the Museum of Texas Tech University consists of mammals, birds, and invertebrates. The greatest number of loans and relevant research material is associated with the genetic resources collection. There are in excess of 220,000 vials of frozen tissue, as well as isolated DNA samples, and lysis buffer and ethanol-stored samples. The main collection is from mammals, however there are other samples of other taxa collected opportunistically. The significance and power of this collection to address natural history issues is not limited only to the production of classical species trees but it provides additional insights into what diseases a species carries, level of pollution,

as is a source of genes for recombinant DNA study and its economic development, where appropriate. The genetic resources collection, as well as similar collections, is the basis for the development of the genetic species concept that provides a better understanding of the forces that have resulted in the diversity of mammals worldwide. The focus of this presentation is on the value of the collection of mammals and the collection of genetic resources as a research resource. However, it should be noted that all collections in the Museum of Texas Tech University are available to qualified scientists, artists, or other appropriate researchers. All collections follow written collections management policy and procedures for loans, study, destructive analysis, etc.

The mammal collection at Texas Tech was started in the early 1960s. By 1967 there were 8,000 specimens. Today the collection has 110,000-catalogued specimens. The genetic resources collection was initiated in the mid 1970s and today has 250,000 vials of tissues from numerous species. These two collections have been used as a source for over 1,000 scientific papers and refereed journals and have been a major data source for over 75 doctoral dissertations and 75 master's theses. Individual researchers who used these collections as part of their graduate education include David J. Schmidly, Terry L. Yates, O. James Richmond, John W. Bickham, Kateryna Makova, Ron Van Den Bussche, Anton Nekrutenko, Cody Edwards, Darren Carroll, Heather N. Meeks, Peter V. August, Andrew DeWoody, David Webster, Paisley Kato, Serena Reeder, Brian Ammann, Irine Tiemann-Boege, Moira Van Steadden, Michael Arnold, Ira Greenbaum, Ben Coop, Kimberlyn Nelson, Cole Matson, William J. Blier, Rodney Honeycutt, Mazin Qumsiyeh, Meredith Hamilton, Joaquin Arroyo-Cabrales, Brenda Rodgers, Jeff Wickliffe, and Sergio Solari. These individuals have not only been faculty members at significant educational institutions but they also include individuals who have been presidents of universities, leaders of government initiatives, and directors of NSF divisions. Using museum collections to study biodiversity and to describe life thus appears to be an excellent experience to gain an intellectual and educational perspective relative to academic and other areas of success.

Successful research efforts have been accomplished through several types of studies. In some cases specimens that originally have been collected for chromosomal data have been studied again in a new light when new methods such as mitochondrial DNA, Amplified Fragment Length Polymorphism, chromosomal painting and banding, etc. have been developed. In these cases new experimental designs draw heavily from the results and conclusions of the earlier studies.

There are museum issues that need to be addressed using voucher specimens with genetic resources curated in the form of tissues. Tissue loans are destructive, and, for any given specimen, there is a finite amount of material available to be studied. Tissues are expensive to collect, archive, and include in databases that must be searched by mammalogists, molecular geneticists or conservation biologists, in comparison to loans of voucher specimens that have classically been made between two museums. Very few of the loan requests for tissues for molecular and genetic analysis are from individuals associated with a museum. This makes enforcing conditions of a loan difficult since non-museum institutions are not always understanding or appreciative of tradition loan agreements and conditions. Research into biodiversity requires new types of museum collections that interface with national security issue such as human disease, ecotoxicology, etc., and involve scientists who do not typically operate within a museum environment. Sometimes this taxes the application of the traditional museological concepts and requires changes in curation methods, database structure, loan procedures, and safety of staff. For example, our team has been studying the biological consequences of chronic exposure to radiation since 1994. All of the specimens used by us are curated in the Museum of Texas Tech University. This arrangement provides two benefits for an ecotoxicological study. First, these specimens can be used for traditional study and will still be available as new methods are developed. Second, if there is reason to question our results this will be possible by having independent researchers in other labs where our experiments can be replicated.

Weaving the significance of museum collections into issues such as public health, disease, and bioterrorism (PHILLIPS ET AL. 2009) greatly helps justify the need for such collections. Three examples are: *The ecology and evolutionary history of an emergent disease: Hantavirus Pulmonary Syndrome*. Bioscience (YATES ET AL. 2002); *Predicted Hantavirus Risk in 2006 for the Southwestern U.S.* Occasional Papers, Museum of Texas Tech (GLASS ET AL. 2006); and *Global disease surveillance, Emergent disease preparedness, and National security*. Publication of Museum of Texas Tech University (PHILLIPS ET AL. 2009). The Bioscience article establishes how ocean currents in the Pacific affect the probability of contacting Hantavirus in the South Western United States. The Occasional Paper publication predicted specific Hantavirus risk areas in New Mexico and Arizona, as well as the time of risk before actual risk occurred. Some areas in New Mexico and Arizona had a high risk whereas others had a low risk. The data on which these risks were established was based on tissues and voucher specimens archived in museums.¹

The vertebrate paleontology collection at the Museum of Texas Tech University: Its role in teaching, exhibit, and research

The collection of fossil vertebrates at the museum is an important resource for teaching paleontology and evolution to undergraduate and graduate students from the geology, biology, and museum science and heritage management departments. Museum science and heritage management students use the collection actively for learning barcoding, housing, and cataloging of specimens. They also utilize the paleontology lab for learning the preparation of fossil specimens and basic molding and casting technique. The holdings of fossil vertebrates from the Triassic of Texas and Cretaceous of Antarctica have been utilized by researchers from all over the world. The permanent *Changing World* (Dinosaur Hall) exhibition has become a window through which local school children and adults are introduced informally to science, natural history, evolution, changing environments, plate tectonics, volcanisms, and mass extinction. The Triassic fossil sites near Post have become a proximate field laboratory for teaching various collecting techniques. Active field programs in different parts of the world including Antarctica, China, Brazil, South America, and India have amassed a large collection of fossil material or their replicas and fostered international collaboration. Exquisite three-dimensional replicas of pterosaurs from Brazil, now housed at the museum, have been used to study their flight dynamics. The collaboration on pterosaur flight with an aeronautical engineer has led to a novel design of a robotic spy plane that not only flies but also walks and sails just like the original.

The story of vertebrate evolution during the past 500 million years is based on fossils, the remains or traces of ancient backboned animals, which have been preserved in the sedimentary rocks of the earth's crust. Vertebrate paleontology, in a certain sense, is the study of fossils, for all of its reconstructions and theories are based on these objects. The purpose of the vertebrate paleontology (VP) collection at the Museum of Texas Tech University is to obtain and preserve the record of fossil vertebrates for research and education, to curate them in an orderly and accessible fashion, and to maintain the records of their source and origin. Fossil specimens are used in teaching paleontology and in advancing knowledge of various aspects of this science through research. An active research program is essential if a collection is to be properly maintained and utilized.

A university-held collection is an intellectual resource, intellectual property, and an integral part of the institution of higher education. Vertebrate fossils are a non-renewable natural resource relating to the evolutionary history of animals. These collections are truly irreplaceable and they are held as a public trust. They are living testimony to the past of our world and must be passed to the generations who

¹ All three of the articles are available on our website at www.nsr.ttu.edu (accessed December 20, 2010).

are to come. The VP collection at the museum contains both fossil specimens and casts along with their associated documentation from the Pennsylvanian to the Pleistocene periods. They comprise the tangible base for taxonomic, biostratigraphic, and morphologic interpretations in the history of vertebrate life. They provide the data needed to understand the nature and extent of interconnections between biological and environmental processes over geologic time. The collections contain a number of holotype specimens, which were used by the original authors in erection of new species. Casts are especially useful for comparative studies and biomechanical analysis, which can be applied to research and teaching. The VP division accepts the responsibility of collecting, conserving, housing, and maintaining records and collections of vertebrate fossils.

The VP collection, though of modest size, is one of the important research collections, numbering over 20,000-catalogued specimens assembled over a period of more than 70 years. The holdings of fossil vertebrates from the Triassic of Texas, the Cretaceous of Antarctica, and the Mio-Pliocene of the High Plains of Texas have come into prominence as one of the best in the nation. The collections contain representatives of major groups of vertebrates including fish, amphibians, reptiles, birds, and mammals.

Research almost always entails acquisition of additional material and growth of the research collection. Specimens for the VP collections are acquired chiefly by active field expeditions by faculty, staff, and graduate students. The most prolific fossils sites of Late Triassic vertebrates and Neogene Blanco faunas lie within 50-miles-radius of the museum campus on private lands. Landowners are very generous in granting permission to the museum to explore their property for fossils and in their support for research. Some of the Triassic fossil sites in the Crosby and Garza counties of Texas are used for teaching field methods for museum, heritage, and geology students, who learn how to find and excavate fossils, record field data, collect bones, and jacket them with casts of polypropylene matting and plaster of Paris before they are removed from the matrix.

The paleontology division has a state-of-the-art lab and a casting lab with all modern equipment. Field specimens are brought to the lab and stored with their field labels until each specimen is prepared. In the laboratory, the field collection process is reversed: the plaster jackets are removed, and the fossil bones are extracted from the matrix and reinforced by consolidants such as Butvar and paper pulp. During the course of the in-lab collection process, all the documentation including locality data, latitudes and longitudes, stratigraphic levels, field sketches and photographs of excavations are carefully recorded.

The Late Triassic vertebrates at the museum during the dawn age of dinosaurs represent one of the finest and most comprehensive collections in the world in terms of the variety of species and quality of preservation. Several expeditions to Antarctica have yielded one of the largest collections of Permo-Triassic plant fossils and Late Cretaceous marine vertebrates. Particularly significant is the presence of several types of sharks, bony fish, plesiosaurs, mosasaurs, and the oldest loon. Fieldwork in India, China, and Brazil produced important collaborative research, although the fossils were kept in host institutions. Portions of the VP collection were through fieldwork supported by funding agencies such as the National Science Foundation and the National Geographic Society.

The collections of fossil vertebrates and other geological specimens in the museum are important resources for research and teaching in paleontology. We have excellent steel cabinet furniture for housing specimens, and climate-controlled collections housing areas, which are locked for safety and security. Both the specimens and their associated information are organized and easily accessible. Each catalog number is cross-referenced to geological horizon, taxonomic name, and/or locality in the catalog database for easy retrieval. Barcoding is used to capture and retrieve data for each specimen. A laser surface scanning lab is used to capture specimens in three dimensions, and resulting images

are used in research, animation, and teaching. As collections information is computerized, data can be more widely shared.

The primary uses of the VP collections are in teaching, scientific research, and exhibits. Dissemination of scientific research in VP division is carried out through peer-reviewed publications, lectures at national and international conferences, display for general public, popular lectures, and formal and informal educational programs and activities.

The museum is internationally acclaimed for its graduate programs in museum science and heritage management and has acquired a reputation for excellence. Through classroom lectures and hands-on experiential learning, the museum provides invaluable experience for graduate students wishing to enter the museum and heritage profession. Students utilize the collections in practicum projects, experience in collection management techniques, and for research projects, including topics for theses and dissertations.

The VP collections serve a variety of research purposes: (1) They are the basis for original scientific research on the age, affinity, anatomy, and evolution of the animals; (2) They provide a scientific record of the extinct biotic assemblages, their anatomy, adaptation, and mode of life. (3) They are used to train present-day graduate students and will be used to train coming generations of scientists. (4) They are used in exhibits, lectures, and other educational programs to disseminate knowledge. (5) They are open to qualified investigators from other institutions, for comparative studies. Researchers from all over the world come to the museum to study the collection.

Its curator has published many monographs, books, and peer-reviewed papers on the basis of the museum's collection that received national and international attention.

The VP collection also contains many examples of high-fidelity cast skeletons of dinosaurs, pterosaurs, and mammalian teeth, which are important components for teaching, research, and exhibit. The assemblage of cast skeletons of pterosaurs is one the best in the nation and has been used for animal flight research by the curator and the inspiration for designing the pterodrone, a robotic spy plane, to be used for defense purposes. The pterodrone, which can walk, fly, and sail now is in development in collaboration with an aeronautical engineer.

The museum is considered one of the world's best repositories of Antarctic material because of long and active fieldwork beginning in 1933 when the late Alton Wade made his first of seven trips to Antarctica as a member of the Second Byrd Expedition. During 1980s, several expeditions from the paleontology division brought back valuable vertebrate fossils and plant material from Antarctica.

Museums are centers for public learning available to all without regard to age, background, or knowledge. Exhibits are the principal means by which museums engage the public. A dinosaur gallery is often the window through which many children and adults are first introduced to science and natural history. In 2004 *Changing Worlds*, a permanent exhibition of dinosaurs, in a 9,000-square-foot exhibition space opened at the museum. There are only ten university museums in the nation that have permanent dinosaur exhibits; the museum is now one of these elite groups. Thousands of visitors every year pass through three galleries of Mesozoic life that feature critical events in the rise and fall of dinosaurs in relation to the drifting continents: from the beginning in the Triassic Pangean world along with other archosaurs, radiation and gigantism in the Jurassic, to their diversification and disappearance in the Cretaceous. Visitors range from the general public to classes from the local schools coming to study the exhibits as part of their science education.

Conclusion

What is the value to a university in having a museum? Why is an institution that aims to preserve both tangible objects and intangible information and expression considered important, or even necessary, especially in this age of digital information and virtual experience? The answer lies in what collections can reveal, not only under current investigative techniques, methodologies, and philosophies, but also for what they may reveal in the future. They provide examples of items and adaptations produced in relation to the ways in which species, cultures, and places have responded to the environment from their origin to the present day. They reveal stories in ways that other records often do not.

Collections are non-renewable resources, once gone, never again available for the future. Through the preservation of collections, museums provide universities with possibilities for future research and teaching that are unparalleled by any other kind of institution. The unique mission and purpose of a museum supports the university in its endeavors by providing a place for the in-perpetuity preservation of works, artifacts, objects, and specimens on which research and teaching is based. Additionally, the museum characteristically is an interdisciplinary institution that provides opportunities for research and teaching across disciplines that may not so easily be achieved in traditional university academic departments.

The International Council of Museums (ICOM) *Code of Ethics for Museums* states that museums that maintain collections hold them in trust for the benefit of society and its development (INTERNATIONAL COUNCIL OF MUSEUMS 2006). Museums must acquire, conserve, and exhibit collections, and educate the public about these collections. Developing an understanding of the cultural and environmental past based on collections is important not only in and of itself, but is critical for understanding the present and creating a viable future. A university museum is a unique interface between the academic and research community and the wider public and because of this is critically placed to disseminate new knowledge and information to a broader community.

The Museum of Texas Tech University supports an educational institution that was established to provide both traditional academic and vocational education to contribute to the economic development of the State of Texas at a time when this was of great importance. The museum continues to support the university through the acquisition and preservation and use of collections that provide faculty, staff, students, and the wider public with access to a wealth of diverse natural and cultural material for research, teaching, and interpretation purposes. The museum's special multi and interdisciplinary collections-based research and teaching approach provides a place for collections to be protected in-perpetuity so that current and future research potential is developed, accounted for, and safeguarded.

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Contact

Nicola Ladkin, MA

Assistant Director

Address: Center for Advanced Study of Museum Science and Heritage Management, Museum of Texas Tech University, Lubbock, TX 79409-3191, USA

E-mail: nicky.ladkin@ttu.edu

www.depts.ttu.edu/museumttu/

Eileen Johnson, PhD

Director of Lubbock Lake Landmark

Address: Museum of Texas Tech University, Lubbock, TX 79409-3191, USA

eileen.johnson@ttu.edu

Robert J. Baker, PhD

Director of the Natural Science Research Laboratory

Address: Museum of Texas Tech University, Lubbock, TX 79409-3191, USA

robert.baker@ttu.edu

Sankar Chatterjee, PhD

Curator of Paleontology

Address: Museum of Texas Tech University, Lubbock, TX 79409-3191, USA

sankar.chatterjee@ttu.edu

Mendel Museum, the first university museum in the Czech Republic – Short excursion to the history of university museums in the Czech Republic

ONDŘEJ DOSTÁL

Abstract

Mendel Museum has been a part of Masaryk University since 2007 and is the first comprehensive university museum in the modern history of the Czech Republic. It aims to promote the legacy of Gregor Johann Mendel, the Augustinian monk who discovered the basic principles of heredity in the Abbey of Old Brno. These principles have become the starting point for a new field of study – genetics. Mendel Museum prepares short-term exhibitions that promote the work of the university. Although Czech legislation does not acknowledge the independent category of ‘university museum’, the Mendel Museum conducts its operations under the Czech legislation for museums; this ensures the protection of collections and collection objects.

Introduction

Masaryk University is the second largest university in the Czech Republic. The university now runs a museum that manages collections, presents university research achievements, connects the university environment with the public and welcomes elementary and secondary school students. The museum bears the name of the world-famous scientist G. J. Mendel. University museums face many problems, which are not always economic. The major problem is the promotion of the museum as a necessary part of university that preserves the cultural heritage of the academic environment. Historical evolution and revivalist movements had led to foundation of many museums associated with social activities rather than university museums.

History of Czech university museums

The history of collecting in the Czech lands goes back to 11th century. As described by Kouba (1988; ŽALMAN 2005), collecting first focused on the so called Christian collecting. Later collections were obtained by the Crown and nobles. They were gathered in mansions. The beginning of museology in the Czech lands is connected with the revivalist movements at the turn of 18th and 19th century. There were no museums established within universities. We may, however, speak of ‘cabinets’. One of the donors of the so called natural sciences cabinet of Charles University was Count Kinsky. He was one of first to suggest the idea of establishing a ‘Czech museum’ in order to present the beauty of the Czech Kingdom.

Charles University is the oldest university in the Czech Republic. It was established by Charles IV in 1348. Other Czech universities were founded at the end of 19th and beginning of 20th century.

The above mentioned cabinet has the longest history of all and can be considered to be the oldest university mineralogy museum. The Charles University Museum was established in the period after the First World War. It was founded on the basis of a gift of anthropological material to Charles University and Czech people from the world-famous anthropologist Dr Aleš Hrdlička. The first Czech president, T. G. Masaryk, also supported foundation of the museum. The museum is now part of Charles University’s Faculty of Science.

Another museum at the university is Chlupáč Museum of earth history and cartography. Chlupáč Museum was founded in 2004 and is the youngest museum of the CU Faculty of Science. The

cartographic collection dates back to 1920 and is one of the most important map collections in the Czech Republic.

Another museum in the history of university museums is the Masaryk University's Mendel Museum. Masaryk University (MU) was founded in 1919 after independent Czechoslovakia was formed. The museum was started in 2007. It is the first museum in the country to have services and administration of all MU collections among its tasks. This Mendel Museum is a progressive concept and should provide guidelines to other universities on how to handle collections.

The Czech museum legislation

Museums in the Czech Republic (CR) are governed by act no. 122 of 2000. The act defines terms as collection, collection item, and methods of handling. The act defines the term CES, which stands for Centrální Evidence Sbírek (Central Register of Collections) with Ministry of Culture of the CR. The CES web page states:

"The Ministry of Culture inscribed on the Central Register of Collections (CES) all collections (owned by the State and the regional and local municipalities), whose managers – museums and galleries – were obliged ex lege to apply for registration of the collections. Collections owned by other legal entities and individuals have also been inscribed, provided that the owners decided to have them inscribed. The list of collections inscribed on the CES includes: the name of the collection, information about the owner of the collection, information about the manager of the collection, which is as a rule a museum or gallery (a gallery being a fine arts museum), separately recorded parts constituting the collections; each of these parts ("subcollections") is focused on a specific area, characteristics of each subcollection, containing: indication of the territory from which the subcollection primarily comes, the period that is primarily documented by the subcollection, and a brief history of the subcollection, the types of objects and materials that are primarily represented in the subcollection, indication whether the subcollection includes cultural relics or archival documents. Hence, the CES primarily is: 1. a complete overview of museums and galleries founded by the government or by the regional or local municipalities and a list of their collections, briefly characterised and not published anywhere else. 2. information about the specialised areas in which museums and galleries do their collecting work. 3. information about which collections enjoy, or may enjoy, subsidisation from public funds. 4. and also information about a number of other collections that are owned by other legal entities or individuals."¹

Neither this act or other amendments and by-laws define the term university museum. Thus it classifies university collections as collections of other legal entities. It is a paradox, especially because a public university manages public resources and its collections are surely part of the national cultural heritage. A public university can be called a national cultural heritage, too. Public universities educate and employ scholars who are a crucial element of society and the creation of its values; values future generations lean on. To understand collections as the possessions of so called other legal entities downgrades them to something that is part of free market, something that does not need special care. The law protects museums and their collections established by the state, regional governments and municipalities. University museums were not considered by the legislators because a couple of museums at one university did not attract legislative attention. Most museums are established by state and local governments.

Another important factor is the specific university environment. Universities primarily exercise educational and research activities. Therefore, the collections are sometimes neglected, even if they have the potential to be part of education as well as research and community outreach. University

¹ ces.mkcr.cz/en/ces.php (accessed November 24, 2010).

collections can only be included into CES if they handled as a common museum collection, which can may cause troubles in class work.

Mendel Museum

The Mendel Museum has been the part of Masaryk University since 2007. This workplace is located within the precincts of the Augustinian Abbey in Old Brno. It aims to promote the legacy of Augustinian abbot G. J. Mendel, who is known primarily for his studies conducted on plants, peas in particular. However, Mendel's also carried out other research in the field of apiology, or breeding of bees. Abbot Mendel has become an icon of modern biology and is rightly called the father of genetics. Despite his persistence, diligence, and analytical approach, his work was fully appreciated only after his death.

Therefore, one of the aims of the museum is to promote Mendel's genius. It also tries to raise awareness about the fields of study available at MU. The connection of educational efforts of the museum with theoretical aspects of several fields of study makes the Mendel Museum a significant place that connects science with practice. It allows academics to interact with the wider public.

The visitor to the museum can attend permanent and temporary exhibitions as well as visit Mendel's apiary in the abbey's garden. In addition, lectures from the *Mendel lectures* cycle, introducing outstanding personalities from the fields of biology, genetics, and molecular biology, attract those interested in science.

Masaryk University Collection

Masaryk University owns, like many other universities, collections and collection items. The items are used during classes. Only some items are of true museum nature. In compliance with the Czech legislation, a collection with three sub-collections has been created. The sub-collections are art, paleontology and mineralogy. The management is carried out by Mendel Museum. The structure of handling the collection is shown in fig. 1. An objective of Mendel Museum is to administer all potential

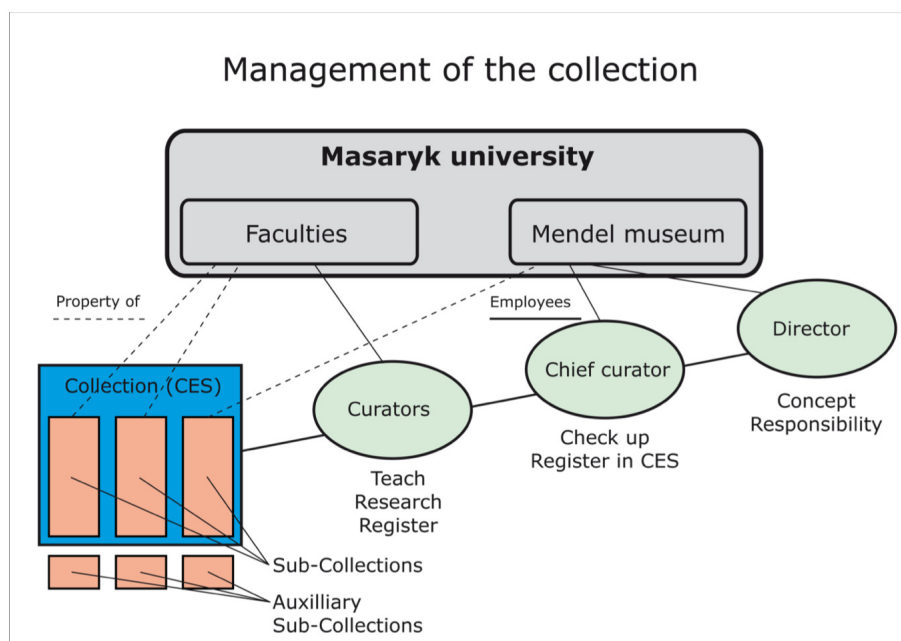


Fig. 1 - The structure of handling the collection

collections of Masaryk University. This does not mean to transfer them to one place, but to set rules for their care and use. The herbarium and anatomy collections could be among other sub-collections.

Conclusion

Museums and universities in the Czech lands have a great tradition. However, the period of political changes from the end of 19th to the second half of 20th

century has created some problems for museums. Universities and museums developed independently from each other although universities collaborated with museums and many academics worked in museums.

The Mendel Museum at Masaryk University has played a significant part in shaping the role of university museums in the Czech Republic. It is important that museums and universities work closely together in order to preserve and to use the collections of universities. The way that Masaryk University handles its collections should become the starting point and guideline for work with collections in other universities.

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Contact

Ondřej Dostál, PhD

Director of the Mendel Museum

Address: Masaryk University, Mendel Museum, Mendlovo nám. 1a, 603 00 Brno, Czech Republic

E-mail: dostal@rect.muni.cz

Reorganizing a 20th century cabinet of curiosities into a museum for the 21st century

ISABEL M. GARCÍA FERNÁNDEZ

Abstract

This paper describes the life of a university museum that was born in the 1980s and transformed in the 21st century. Over a period of 25 years Professor Reverte collected more than 3700 objects and set up an authentic cabinet of curiosities dedicated to the fields of anthropology and forensic science. Despite the diversity of its contents, the museum had a recognized scientific interest. It has now undergone changes in order to meet the requirements of new academic demands and public accessibility, but without losing reference to its origins.

Introduction

In Spain the oldest collections were inherited from Enlightenment institutions and the consolidation of scientific and educational collections took place during the 19th and 20th centuries. In the second half of the 20th century the country underwent a major expansion of its university system: new universities were founded and older ones underwent further development; new fields of study were introduced and the number of students and research projects increased. One consequence of all this was the creation of new collections (BARATAS 2008).

In 1836 the Complutense University, which had been founded in the 15th century, moved to Madrid. In 1927 building started on the campus known as 'university city' (Ciudad Universitaria) where most of the faculties, schools and official buildings are now located. As the biggest and oldest university in Spain, the Complutense owns the most varied collections and museums of all the academic institutions in the country, with a total of twelve museums and six major collections.

With respect to its faculties and departments, autonomy of management is facilitated by its size. This also influences the different origins of its collections, forms of access and the various states of conservation.

For this paper we have chosen one particular collection from the Complutense: the medical, forensic and criminal anthropology and paleopathology museum. This is an unusual case within the university that gives rise to an interesting scientific and personal dilemma. The original museum was basically a one-man creation. After almost three decades of continuous growth, it has been transformed and a completely different museum has been developed in response to new institutional needs and visitor requirements, which at the same time attempts not to lose its essence.

The first museum

This is the story of the creation of a university museum in record time, thanks to the effort and dedication of one man: Professor Reverte Coma, ex-director of the School of Legal Medicine, who collected and organized an incredible number of objects. Although they were based on his personal tastes and interests, they filled a large gap with respect to Spanish collections and research in this field.

In barely 25 years (from 1980 to 2005) Professor Reverte was able to collect more than 3,700 objects and specimens related to the fields of anthropology and forensic science (fig. 1–2).

He was the only person behind this project and, although the museum was officially created in 1994 by a university act, it was not until the year 2000 that it was given his name: the Professor Reverte Coma Museum. He organized it as an instrument for education and research in the following areas:



Fig. 1 - The Medical and Forensic Anthropology Museum is located in the Faculty of Medicine belonging to the Universidad Complutense of Madrid.



Fig. 2 - Professor Reverte Coma in his office.

forensic anthropology, medical anthropology, criminal investigation, paleopathology, cultural anthropology, anatomy (human and animal), the study of mummies, scientific instruments and botany.

The different areas were not clearly defined in the exhibition space. The most comprehensive were the criminal anthropology and criminology sections, which included subjects such as weapons, instruments of execution, terrorism, forgeries and the skulls of famous killers.

We may well wonder how he managed to collect so many objects with very little support and practically no money. The answer to that question lies in his personality. Professor Reverte is a man of great enthusiasm. During his professional life he travelled all over the world, especially to South America and Asia, which he visited with great frequency. A large part of the collection is made up of his own purchases, which are a true reflection of his varied interests. As an extremely active and involved criminal investigator he was able to amass a wealth of material derived from his research work, including material obtained from archaeological excavations. He had

many friends in the police department, courts and customs services and received a considerable number of valuable donations for his museum (although we should mention that not everything was worth keeping in a museum). Other objects came from previously existing institutions, although much of this material was lost when it was moved to the new campus. Among these donor institutions were the School of Legal Medicine at the San Carlos Hospital in Madrid and its museum of crime, and the old Hospital of San Juan de Dios whose collections were in poor condition due to many years of neglect. He also received an important donation consisting of a collection of bizarre objects from the emblematic Carabanchel prison in Madrid, which was in use from 1944 to 1999.

Accessions were constant; numerous gifts from private individuals would arrive at the museum every month and almost everything was put on display. It was not long before Reverte had to look for additional display space and took to using hallways to house showcases and information panels. The donations he received were not restricted to objects or specimens; thanks to his contacts, he was also able to acquire money for furnishing the museum. This included multimedia devices and a system for visually impaired visitors.

The educational aspect of the museum was always present and its use as an educational tool for students and regular visitors meant a constant search for appropriate media. Reverte designed 23 backlit panels which were used to illustrate and clarify certain aspects of the museum discourse. A CD-Rom and a webpage were also created for the museum.

The reports he wrote personally in the years 2000 and 2001 are a testimony to the enormous amount of work he put in during a very short period of time (fig. 3–4).



Fig. 3 and 4 - The museum was from its origins an authentic cabinet of curiosities created in the 20th century.

The creation of his museum was inspired by the Dupuytren Museum, the Orfila Museum and the Hunterian Museum, all founded by eminent physicians and professors of medicine in the 19th century. William Hunter and Pierre Guilliame Dupuytren also shared a passion for collecting and were able to gather together a unique array of objects related to medical practices and advances. Prominent among their collections are those related to anatomy and pathology, which include some very interesting and striking specimens.

Professor Reverte recognized his own work in these examples. He also had a closer model in Dr Velasco, who in 1875 assembled the oldest physical anthropology collection in Spain; objects and specimens from the original collection can be found today in the National Anthropology Museum, the National Archaeological Museum and the Natural History Museum. The second half of the 20th century saw a loss of interest in physical anthropology collections and these were abandoned. Most of them ended up in universities where in recent years they have been put to use in general terms. This circumstance emphasizes the importance of the project developed by Professor Reverte.

In the case of the Reverte Museum, not only do the collections contain pieces of important historical value, they are above all highly comprehensive. This is due to the variety of subjects presented and their extensive geographical provenance. Professor Reverte's intention was to show anthropology as the great science of man. However, this idea was defined by his counterparts as a project that was impossible to carry through (RONZÓN 1991).

Despite its anachronistic beginnings and the limited space available for the collections (less than 200 square meters, comprising three exhibit rooms, a laboratory, an office and a small storage area), the museum was of great significance. It contained certain specimens and objects that were unique and one of the largest collections of mummies in Spain. In its relatively short life it received many curious visitors from both within the academic world and outside it (RUIZ 2008). Reverte was in charge of the guided tours and the visit was always an unforgettable experience, thanks to his ability to communicate his own enthusiasm about every subject and object.

His legacy when he retired seemed overwhelming. On assuming the responsibility of new director, his successor, Dr Sánchez, also realized that a change in the discourse and orientation of the museum was called for. It turned out to be a difficult task since part of the essence of the original museum could be lost.

The first step was to analyze the content and characteristics of the collections in order to devise a new classification. In museum vocabulary, the notion of the term 'collection' has many different definitions and connotations. This is shown by the following three examples:

1. "The collected object of a museum, acquired and preserved because of their potential value as examples, as reference material, or as objects of aesthetic or educational importance" (BURCAW 1983, 4).
2. "A collection is deemed to be not only the outcome but also the source of a scientific programme aimed at acquisitions and research through material and immaterial evidences of mankind and his environment".
3. A more open definition states that a collection is a "set of objects brought together intentionally according to a very specific rationale which allows them to preserve their individualism" (ICOFOM 2009, 60–61).

When all the above is taken into consideration, it is obvious that what was inherited was a true collection containing reference materials, most of them of great scientific and educational interest. It followed a specific rationale that emanated from Professor Reverte's personal viewpoint:

„My idea of a museum is like a living creature which is constantly being fed and grows unremittingly, and the soul behind its creation and whoever helped him are always present in its display cases, exhibit rooms and collections. It sends constant messages, both obvious and hidden, to the mind of the visitor, whose impression of the museum will remain with him for the rest of his life.“¹

The creation and consolidation of museums and collections takes time. In this case the time period was very short so an evaluation of the selection criteria was necessary. In the new project, extending the collections is not considered a priority but studying them is essential in order to establish the most appropriate educational methodology.

New project

The new project was started in 2005. The first task was to redefine objectives. Very intensive research and work on documentation has been carried out and is still ongoing since in most cases the museum only had a list of objects, with no indication of their provenance.

After evaluation of the museum collections and assessment of their scientific relevance and the visitor profile, a new arrangement was proposed. The display was divided into seven subject areas: medical and forensic anthropology, the history of anthropology and criminal investigation, evolution in anthropology, paleopathology, cultural anthropology and ethnobotany. It was also proposed to set aside an entire room dedicated to mummified human remains. This room is especially controlled because of the nature of the subject and its delicate state of conservation. Collections with emotional value have been excluded and some of the objects have been put on display in a special area dedicated to Professor Reverte (RUIZ 2008).

¹ www.gorgas.gob.pa/museoafc/home.html (accessed December 1, 2010).

As a result, a selection of significant objects is now on display and the rest will be made accessible to researchers and students. A major part of the collection is on permanent loan to other museums within the university and what remained has been packed away and stored.



Fig. 5 - Dr Sánchez, Mónica Ruiz and Mercedes González, the driving force of the new museum working on the new arrangement.

Transformation work turned out to be slow but it was constant. The following people were involved: the new director, an intern and a large number of volunteers, including an architect, university professors, a museum conservator, a group of dedicated and enthusiastic students from the fields of forensic medicine and criminal investigation and postgraduate students from the M.A. in conservation and M.A. in archaeology programmes (fig. 5).

We are still working on a collection management plan that includes a preventive conservation plan involving the reorganization of storage and improvement of climatic conditions for

display purposes. In addition, we have prepared a protocol for the handling and use of the collections, to be followed by museum and school staff, students, researchers and visitors alike.

The museum has recently started lending objects to other institutions and is developing an intensive research policy, taking into account that most of the objects and specimens have never previously been studied or published. We are well aware that there are many precious materials waiting to be discovered.

Museography

The new display arrangement in the exhibition spaces is based on two major scientific areas: medical anthropology and paleopathology. All the areas in which the museum was originally organized are represented in this new arrangement, but with a different layout.

It could be said that we have moved on from an accumulative and storage-like exhibit to the presentation of representative objects of scientific, cultural or historical value.



Fig. 6 and 7 - The new display arrangement in the exhibition spaces is based on two major scientific areas: medical anthropology and paleopathology.



Fig. 8 - The special display case dedicated to Professor Reverte is still in construction.



Fig. 9 - This picture shows the old (past) and new (future) signs of the museum. The name of Professor Reverte Coma appears in both.

space was extended with the addition of a small room and the museum now has four display rooms. The original display cases have been used after slight modifications. A new logo and information panels have been designed and we are currently working on a new webpage for the museum.

The museum was opened on July 14th 2009 and it has already been visited by a number of interested groups from outside the university (fig. 6–8).

In the new discourse, research and teaching are fostered by answering questions about the lives of our ancestors: what they were like, how they lived, what they ate, how and when they died, whether they were wealthy ... It is easy to identify the clues but visitors need to take time to think about them and this in turn enriches the learning process (fig. 9).

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Contact

Isabel M. García Fernández

Professor for Museology at the Fine Arts School, Complutense University of Madrid

Address: Painting and Restoration Department, Fine Arts School, Universidad Complutense Madrid,

C/ Greco, 2, 28040 Madrid, Spain

E-mail: museoig@art.ucm.es

www.museorevertecoma.org

Visitor profiling for, and promotion of the biological and earth sciences museums, Macquarie University

ALISHA HALLIWELL & ANDREW SIMPSON

Abstract

In 2007 Macquarie University undertook a significant restructure. It was anticipated that this would impact on the viability of the programs and resources of campus museums. The changes to university management practices involved possible cessation of centralized funding contributions to museum management. The biological and earth sciences museums, along with the other museums on campus, felt compelled to demonstrate a capacity for independent operation in case justifying their financial position became a key criteria for survival. A research project was designed and undertaken to identify and highlight the services of the biological and earth sciences museums at Macquarie University in order to increase their audience base.

The results of this research have lead to the identification of distinct potential audiences and the formation of new promotional strategies within the Faculty of Science.

Introduction

Macquarie University is a medium sized tertiary education institution in the suburban north-west of Sydney. A recent change in leadership at the university has prompted a significant restructure of academic departments and review of the curriculum. As a result of this, two former academic divisions namely, environmental and life sciences and information and communications sciences, were merged to form a new Faculty of Science. Material collections within the new faculty were all derived from the former division of environmental and life sciences. These consist of the Biological Sciences Museum, the Earth Sciences Museum and the Downing Herbarium. The herbarium is essentially a reference collection that supports research and teaching, there is no facility for exhibition and little consideration regarding community engagement. This paper therefore focuses on the two natural history collections with exhibition spaces.

The funding model for different university services was under scrutiny as part of the restructure. Prior to this, the university's museums and collections, while grounded within different administrative structures related to their academic discipline, received some level of centralized financial contribution in recognition of the role these museums played beyond their academic discipline. There was concern among museum staff that this centralized support may be withdrawn, and a number of strategic initiatives were devised. The one described in this paper involved audience profiling research for the two museums by a museum studies masters student (Halliwell).

A user-needs analysis was undertaken to identify relevant audience groups for both museums that would provide the most benefit to them in the long term. Another user-needs analysis was undertaken with the identified groups to determine the types of promotional material that would encourage those visitors to the museums. A series of relevant promotional material was then developed.

The biological and earth sciences museums at Macquarie University are two very different types of museums. Both offer hands-on educational activities for visitors, but have different physical and operational principles. At the time of this research, the Biological Sciences Museum was organized in a conventional layout, with its collection exhibited in display cabinets within a centralized location. This has the advantage of a set location for education programs. The Earth Sciences Museum, on the other hand, comprises of a series of display cabinets lining the building's corridors with some displays

centered in a high traffic building foyer. In this case, education programs need to be conducted in general purpose teaching rooms within the building.

One of the greatest challenges for small museums is to produce dynamic and innovative programs that will attract regular paying visitors, while working within the confines of a limited budget (HOOPER-GREENHILL 2001). Running a university museum has added challenges; the general public are often unaware of their existence, resources can be limited, and the museum can, in some instances, be hindered by the department they are associated with (SOLINGER 1990). The general decline in financial support for university museums of natural history over the last few decades has been well documented (HUTTERER 2005) despite many arguments forwarded on the role they can play beyond the academy (SCHMIDLY 2001).

Contextualizing different audiences

The audience base of a university museum often consists of university students utilizing the resources of the museum for research purposes at no cost, or where there is a strong education program, the museum may maintain regular school bookings for a small profit. Both of these visitor groups can be problematic for a university museum. While the university student is an essential visitor, aside from the percentage of enrolment fees the department receives, unless utilized effectively the student provides little or no direct financial support to the museum. The benefits of school groups, on the other hand, can only be realized if there is a strong marketing program associated with the museums education programs, otherwise the presence of school bookings may be minimal.

The multi-disciplinary nature of university museums is often cited as a defining characteristic (MURPHY 2003) in comparison with other museums. The multi-audience expectations imposed on university museums receives less attention, with some authors seeing the internal audience as critical. Ashby (2009) characterizes this audience as the most local and the primary client group for university museum activities outside of formal education programs. Similarly, Heruc (2009) documented strategically developed public programs designed specifically for internal audiences.

Striking a balance between internal (staff and student) and external (community groups) is critical and often dependant on a broader institutional vision on the use of material collections in a university context. Horder (2004) explored this balance in the context of a shift away from formal education towards an age of personal learning at every stage of life. Bianco (2009) has argued that dividing programs between these two different stakeholder groups can often lead to an unnecessary duplication of staff effort.

Macquarie University's two museums

The biological and earth sciences museums at Macquarie University provide successful public programs and both are proactively involved in contributing to on campus and community activities. At the time of this research Macquarie University was undergoing departmental restructuring and it was anticipated that the restructure would impact on the viability of the museums' programs and resources. A challenge for the two museums was to highlight their strategic importance within the university, while demonstrating their ability to be self sustaining. Successfully identifying key stakeholders and developing tailored promotional material for those audiences would therefore increase the viability of the two museums.

While the museums already had established education programs, the purpose of this study was to examine the types of people that visited the two museums and identify ways of widening the museums' audience base. The Biological Sciences Museum attracted occasional school groups, including groups who were offered specific educational programs (SIMPSON 2005), university students,

researchers and members from the general public however the practices for enticing new or recurring visitors into the museum did not attract regular bookings.

The Earth Sciences Museum had education programs available to schools (SIMPSON ET AL. 2000) and the community however the marketing of the programs were not extensive and, like the Biological Sciences Museum, there were no formal procedures in place to attract regular bookings.

The purpose of this project was to highlight the services of the two museums to increase their audience base. Three audiences were identified as important for the development of the two museums in question: university students, school groups and community groups. The method chosen to highlight the museum's services consisted of a series of promotional material designed to raise public awareness of the programs and resources available at Macquarie's science museums. The design and production of promotional material for the two museums consisted of a multi-layered approach targeted at the three identified audience groups. It was intended that this material will be trialed on different audiences to measure effectiveness and inform future promotional activities.

Beginning in 1967, the biology museum's collection was developed from teaching material used by the Department of Biological Sciences. In successive years the collection benefited from generous donations from museum supporters and the addition of specimens collected from field trips. In 1993 the museum was redeveloped to conform to international conservation standards in object displays.

The museum housed static and live animal exhibits located throughout the biology buildings. Open Monday to Friday from 9 am to 5 pm, the central display is exhibited in a room within building E8B. The static displays included "taxidermy, spirit (wet) specimens, fossils, corals, plastic embedded specimens, shells, Aboriginal artifacts, pinned insects, castes of dinosaur fossils and footprints and a series of human fetuses"¹. The live displays consisted of Australian fauna, including "pythons, lizards, frogs, ants, stick and leaf insects, freshwater fish and freshwater crustaceans"².

The biology museum was managed by a curator from the Department of Biology along with the university museum officer. The museum was also supported by volunteers, consultants and advisors who were assisted on occasion by students, work experience students and interns.

Many different academic areas within Macquarie University utilized the museum's resources. The museum also received organized group bookings and visits from individuals, both from within the university and outside. School groups also made bookings throughout the year. However there was no formal structure in place to maintain regular bookings.

The biology museum was promoted via a pamphlet, mentioned in the *Macquarie Experience* booklet developed by the university's marketing unit, and has been featured in local newsprint, film documentaries, and news and current affairs programs on the ABC and SBS. PhD students have also published research on specimens analyzed from the museum. Many of the exhibitions and events organized are promoted through the University's *Culture on Campus* newsletter and the museum and its education programs are promoted through the Science Education News journal (a journal of the New South Wales Science Teachers Association).

The museum has a strong sense of identity and purpose. Its website, although outdated, includes information on the museum's mission statement, its history and collection, as well as its programs and services. The website was maintained by the Department of Biological Sciences however it was last

¹ Macquarie University Museums and Collections, Study on the value of museums and collections at Macquarie University: Data Collection, compiled by members of the MUMAC Committee (2007).

² Ibid.

updated in 2002, and referred to programs that are no longer available.³ There is also evidence that the website was designed with the purpose of providing information on the museum's strategic plan and corporate structure. One of the museum's main objectives is to provide dynamic and innovative services while acting as an interface between the University and the public. On many levels, the museum achieves this goal. The museum provides original displays and inspired programs, with a distinctly object-centered focus. Links between exhibition content and scientific principles are described elsewhere (PEARCE & SIMPSON 2010).

Located in building E5A, the Earth Sciences Museum is arranged on a much smaller scale than the Biological Sciences Museum. The collection was also established from teaching material for the division of environmental and life sciences, consists of mineral and rock specimens, fossils, such as gastropods, bryozoans and brachiopods, corals and sponges. The collection is housed in cabinets throughout the earth sciences building. The collection, although impressive, has not benefited from the level of funding or supply of motivated helpers as the biology museum has.

The museum does not have a curator and there is no formal volunteer program in place, however, staff and students from the museum studies program have assisted in the design, maintenance and development of the displays. In recent years this has included thematic exhibitions entitled *Extinctions are Forever*, *The Cambrian Explosion* and *Beyond the Smelter*. The museum is maintained with a small budget from the environmental and life sciences division, and has twice received a small amount of funding from grants.⁴

Unlike the Biological Sciences Museum, the Earth Sciences Museum does not charge for group visits. Visitors are free to wander the halls, viewing the displays. One of the museum's strengths is that the displays are located outside busy thoroughfares and outside classrooms. The location of the displays suggests that, were the displays to be marketed correctly, word of mouth communication could prove an invaluable method for informally promoting the museum. Students often congregate in displays areas prior to or after classes in the general purpose teaching rooms and it is difficult to ascertain the impact of the exhibits in this situation. To combat this, it may be necessary to accompany each display with promotional material.

While there is a brochure about the adjacent Earth Sciences Garden, an external area designed along palaeobiogeographic principles, there is currently no advertising brochure specifically for the Earth Sciences Museum. Information on the Earth Sciences Museum is delivered in brochures for Macquarie University Museums and Collections (MUMAC) and the Science Education News journal.

Due to the limited funding available for the promotion of this collection, the museum does not have its own web portal. Instead, information on the museum's programs is available through the Macquarie University Centre for Ecostratigraphy & Palaeobiology (MUCEP) website.

The two museums were in need of formal procedures for highlighting their services. There were several approaches available for the promotion of the two museums. After completing a user needs analysis for the three audience groups, it was determined that the design and production of multi-layered promotional material for the three audience groups would generate the desired outcome.

After researching user needs and informally conducting discussions with university staff, university students and high school teachers, it became apparent that the audiences who would provide the

³ The Macquarie Experience Program, Public Relations and Marketing Unit. (2007) www.futurestudent.mq.edu.au/undergraduatepublicrelations@mq.edu.au (accessed December 20, 2010).

⁴ Grants were received from the Vice-Chancellors discretionary fund in 2002 and 2003. Macquarie University Museums and Collections, Study on the value of museums and collections at Macquarie University: Data Collection, compiled by members of the MUMAC Committee (2007).

most long-term benefit to the two museums in question fall into three broad categories: university students, school groups and community groups.

Group 1: University students

This audience is particularly valuable for the two museums in question. Firstly, they often have the time, energy and interest to provide a wealth of volunteer services. Students enrolled in courses through the former division of environmental life sciences come into contact with the museums through their studies and are inclined to use the museums' collections for research purposes. There is currently a student group associated with the Biological Sciences Museum, the Macquarie University Biological Sciences Society (MUBS). There is also a geological equivalent (Macquarie University Geological Sciences – MUGS), but this latter group is disconnected from the exhibits and, unlike the biology group, is not a source of volunteers. This is possibly partially due to the distributed nature of exhibits in the Earth Sciences Museum.

The practice of promoting the presence of student volunteers in a museum environment presents multiple benefits, not only for the student, but for the department as well. When deciding on a program of study, students will often choose a course where there is a practical element. Promoting the benefits of volunteering in the biological or earth sciences museums would potentially encourage more students to enroll in respective science courses, ultimately providing a financial benefit for the museums.

One of the projects outcomes will be to design a program of events that will entice Macquarie's students, and students of other universities in the Sydney area, to become involved with the two museums. The program can feature events such as film nights, guest lectures, theme evenings and exhibitions.

Promoting this program will take the form of posters and an updated biology website, with A2 posters being placed around Macquarie and other Sydney universities. The program of events will be designed to minimize the impact of extra workload on university staff. It is anticipated that both student Associations will assist in the running of the program.

Group 2: School groups

School groups are an important and necessary audience for two reasons. The museums' collections can easily be tailored to suit syllabus requirements and the schools, in return, can provide a ready supply of income for the museums. As mentioned previously, there was at the time no formal strategy for attracting school groups to the museums.

The study suggested two advertising media used to attract school groups to the biological and earth sciences museums:

- Teachers from the local district to receive an information booklet promoting the collections, education programs, exhibitions and resources of the two museums;
- A web portal will be designed to expand on the information provided in the booklet.

The purpose of designing a web portal was to provide an information resource that highlights the museums' collections and their relevance to the NSW school syllabus. The portal could, for example, draw attention to local native flora and fauna, contain fact sheets on themes relevant to the NSW science, Aboriginal studies, art and geography syllabuses, and provide completed risk assessment reports to make it easier for teachers to bring students to the museums on excursions. It would also be possible to provide access to an online booking system.

The most likely candidates for maintaining the website will be academic or general staff, or volunteers. In either case, these are people who can be considered time poor. For this reason it is essential that the website design is such that requires minimal maintenance and can be updated by those who may have limited knowledge of web design.

There are a number of other educational ventures in the district that have already developed strong links with a variety of community groups. The *Field of Mars* Educational Centre provides remarkable syllabus-based environmental and natural history education programs to school groups. The programs are hands-on and allow the students to grasp a thorough understanding of the subject matter. It would be advantageous for Macquarie's biology and earth sciences museums to develop a partnership with this centre.

Group 3: Community groups

Attempting to design marketing material for an audience as incalculably and indeterminately construed as 'community groups' would be imprudent. For the purposes of this project, three community groups were identified as relevant audiences and would receive targeted advertising about the museums' services: Probus, Macquarie University Alumni Association, local bush care groups. These groups have been selected because of their proactive interest in local affairs and willingness to volunteer time and effort. If marketed correctly, the biological and earth sciences museums could become a beacon for promoting issues on local geology, flora and fauna, conservation and fossil history. A tri-fold brochure was designed to assist in promotion of the two museums. With the assistance of Macquarie's museums officer, or other relevant speakers, a series of lectures could also be presented to these audiences.

The Macquarie University Alumni Association has already proven to be a valuable supporter of the university's museums. In May 2007, the museums ran sell out tours with the tagline *Rediscover Macquarie's Hidden Treasures* (SIMPSON 2007). Targeting this group would prove to be immensely significant, as members of the alumni are loyal to the university and interested in its many programs and services. Within the alumni ranks are many influential and proactive individuals who may potentially provide future sponsorship for the museums.

Promotional material

The promotional material developed as part of this research project consisted of three media platforms:

1. Paper-based promotional material, such as posters, tri-fold brochures and information booklets
2. Website
3. Public programs

University students

The advertising program targeted towards university students took the form of a program of events specifically designed to entice this audience group into the Biological Science Museum. The program featured events such as film nights, guest lectures, trivia evenings and exhibitions. Held on a week night, the weekly program opened to the public and students were encouraged to bring guests. The program was accompanied by two styles of A2 posters to be placed around Macquarie and other Sydney universities.

The theme of the weekly program focused on the concept of *evolution*. Two posters were designed to highlight the program's theme. The first poster was styled like a 1950s science fiction movie poster.



Fig. 1 - Promotional material for university students – poster *Mutant X* and poster *Planet Evolution*

Consisting primarily of black, grey and red colors, the main focus of the poster is a mutant creation forewarning the future of mankind.

The second poster plays on the theme of the Planet Hollywood restaurants, with the heading of *Planet Evolution*. The poster features martini glasses and promoted VIP passes to the evolution of the planet. Both poster designs play on the theme of cult identity and were chosen to appeal to student humor. It was originally intended to trial these posters on the target group, this did not occur due to subsequent developments at Macquarie in the Faculty of Science (see below).

School groups

Two forms of advertising media will be used to attract school groups to the biological and earth sciences museums; an information brochure and an updated website. An information booklet promoting the collections, education programs, exhibitions and resources of the two museums was to be circulated to local schools, and an updated web portal will be designed to expand on the information provided in the booklet.

The booklet consists of eight pages and highlights the programs and services available at Macquarie's two science museums and feature objects from the two collections. The purpose of the booklet is also to highlight the significance and relevance of the two museums for the NSW school syllabus.

The purpose of designing the web portal was to provide a widely accessible information resource to highlight the museums' collections and their relevance to the NSW syllabus. The website included the museum facility reports and risk assessment reports, to make visiting the museums easier for school groups.



Fig. 2 - Cover of information booklet for schools

Outcomes

The restructuring of departments and funding guidelines within the university highlighted the importance of promoting the cultural value of the Biological and Earth Science museums. The university environment meant that it was necessary to think more laterally about the best way of promoting these two museums. Creating an advertising program based on a multi-media layered



Fig. 3 - Brochure for community groups

Community groups

The community groups targeted included members of Probus, local bush care groups and Macquarie University's alumni. A tri-fold brochure was designed to assist in promotion of the two museums for these audiences. The brochure offers basic information on the biological and earth sciences museums with the purpose of encouraging interest in the programs that the museums offer. The brochure highlights the flexibility of the programs and the availability of both group and individual tours.

Greens, blues, reds and yellows have been used to portray the vibrancy of the museums' collections. Images of visitors experiencing the museums' dynamic displays and hands-on programs have been placed throughout the brochure to highlight the museums' many interactive elements.

platform assisted in reaching the different communication styles mostly utilized by the three chosen audience groups. As funding and resources were likely to be limited, the success of the project lay with accurately targeting the chosen audience groups. Although there are certain difficulties facing these two museums, it was envisaged that their futures were bright and would continue to provide dynamic and innovative public programs.

All of the material developed in this study has to, as yet been used for promotional purposes. The Biological Sciences Department undertook a

substantial refurbishment of its teaching laboratory spaces in 2009, this enabled the development of a whole new series of integrated exhibition spaces. The original museum remains. This study has prompted the formation of a Biology Museum Advisory Group to investigate the future promotion of the museum based on the information developed in this study. Current thinking is favoring web-based developments over the other strategies outlined above. The Earth Sciences Museum is still essentially operating as a space for the development of museum studies exhibition concepts. In 2010, the Faculty of Science received a federal government grant for the refurbishment of the entire E5A building and the future of exhibition areas in this building is still under discussion.

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Contact

Alisha Halliwell

PhD candidate, Museum Studies Program

Address: Macquarie University, Department of Environment and Geography, NSW 2109, Australia

E-mail: alisha.halliwell(at)mq.edu.au

Andrew Simpson, PhD

Director, Museum Studies Program

Address: Macquarie University, Department of Environment and Geography, NSW 2109, Australia

E-mail: asimpson(at)els.mq.edu.au

Documentation and digitalization of the Museum of Criminology of the University of Athens

CONSTANTINE MARAVELIAS, ZOI SAKKI, GEORGE LOUTSIDIS, MARIA STEFANIDOU, SOTIRIS ATHANASELIS & CHARA SPILIOPOULOU

Abstract

The Museum of Criminology is located within the premises of the Department of Forensic Medicine and Toxicology of the Medical School of Athens University. This museum provides a concise picture of the criminal actions committed during the late 19th and the early 20th century in Greece. Its collections consist of items that testify specific violent activities that took place in the provinces of Athens, in the countryside of Greece, as well as in various prisons and often determine the perpetrators' personality, as well.

The aim of the museum is to extract information and knowledge from its collection items through documentation for educational and research purposes. Towards this direction, a number of graduate theses have been completed as well as a large project entitled "Collection, documentation and digitalization of the material of the Museum of Criminology of the National and Kapodistrian University of Athens" has recently been granted and completed.

The Museum of Criminology

The Museum of Criminology was founded in 1932, although the gathering of its collections had began years ago. The museum is located within the premises of the laboratory of forensic medicine and toxicology in Medical School of the University of Athens and constitutes the first university museum in Greece dedicated to criminology and to forensic sciences in general.

Mission and purpose

The museum's *mission* has been not only the complete registration of almost all kind of crimes that took place during the last century in Greece, but also, the preservation and the study of all related evidentiary items sent to the museum. This process includes the collection, classification, annotation and exposition of criminal evidence used in inflicting violent cases that have occurred at different times.



Fig. 1 - Revolver, of Lefauchaux 1860–1870 type, 7 mm caliber. The largest part of the metallic surface is engraved with elaborate nature motifs. Photo: Zoi Sakki © Museum of Criminology, Medical School, University of Athens

The museum's *purpose* is to contribute to the education at undergraduate, graduate and postgraduate levels, as well as to support scientific research in related fields. Towards this direction, a number of graduate theses have been completed as well as a large project entitled *Collection, documentation and digitalization of the material of the Museum of Criminology of the National and Kapodistrian University of Athens* has recently been granted by the EU and completed.

The study of crime history, in addition to the study of related 'unique' and rare items contributes not only to criminology, forensic medicine and toxicology, but also to sciences such as forensic anthropology, sociology and other related fields of social science. In

order for the museum to meet its goals, a website www.criminology-museum.uoa.gr was also created through the above project.

The collections

The collections of the Museum of Criminology are in their major part very old, rare and unique. The main categories exhibited are the following:

- Weaponry of historic value (fig. 1)
- The only one guillotine ever used in Greece (fig. 2)
- Ritual artifacts collection
- Counterfeit banknotes collection
- A large collection of drugs of abuse
- Poisoning evidentiary items collection
- Chemicals and pharmaceuticals collection
- Collection of human remains (fig. 3 – 4)
- Wax models of wounds and injuries concerning violent death cases
- Loops collection used in hanging
- Collection of objects of general forensic medicine interest



Fig. 2 - Wooden guillotine. The guillotine history in Greece is indissolubly bound with the constitution and the modern history of the Greek Republic. The choice of the guillotine as a means of execution for convicted criminals was made by Ludwig I of Bavaria, Otto's father, and was not by chance. Ludwig's goal was to turn this "killing instrument" into the ultimate terror for the Greeks, so that they would not even consider of challenging Otto's power. Photo: Zoi Sakki © Museum of Criminology, Medical School, University of Athens



Fig. 3 - Section of left upper limb, consisting of forearm and arm, which holds a bedside lamp (case of electrocution). Photo: Zoi Sakki © Museum of Criminology, Medical School, University of Athens



Fig. 4 - Mummified fetus. Photo: Zoi Sakki © Museum of Criminology, Medical School, University of Athens

University museum collections in research and teaching

The Museum of Criminology has completed a project entitled *Collection, documentation & digitalization of the material of the Museum of Criminology of the University of Athens*. The project was integrated into the operational program called *Information society* (Meter 2.4, Invitation 91) that was financed at 80% from European Union resources and at 20% from national resources.

This project was crucial for the Museum of Criminology, since the museum belongs to an institute of education and consequently all people should have open access to its collections. In addition, the museum intended to obtain more complete information and knowledge for its collection items through documentation.

The project's purpose was to complete the database of the museum's items that concern specific violent acts, through documentation, digitalization and presentation on the internet (www.criminology-museum.uoa.gr). This way, the digitalization process promotes the preservation of all existing items as well as all the related information. It also facilitates the study of the exhibits. Moreover, a future thorough investigation of the department's archives will upgrade the already existing documentation of items.

The project outcomes

- Documentation of almost 900 museum's items.
- Digitalization of almost 900 museum's items: more than 1.600 2D photos and 18 3D pictures are created.
- New electronic data-base is created and is now available for scientists.
- Museum's web site was created and new benefits are available for the internet users (www.criminology-museum.uoa.gr).

Contact

Constantine Maravelias

Associated Professor in University of Athens and Director of Museum of Criminology

Address: Museum of Criminology, Medical School, University of Athens, 75, M. Asias Str., Goudi, Athens, 11527, Greece

E-mail: [cmaravel\(at\)med.uoa.gr](mailto:cmaravel(at)med.uoa.gr)

www.criminology-museum.uoa.gr

Zoi SAKKI, PhD

Museologist, Conservator of Museum of Criminology

E-mail: [zsakki\(at\)med.uoa.gr](mailto:zsakki(at)med.uoa.gr)

George LOUTSIDIS, PhD

Historian in Museum of Criminology

E-mail: [giorgosloutsidis\(at\)gmail.com](mailto:giorgosloutsidis(at)gmail.com)

Maria STEFANIDOU

Associated Professor in University of Athens and Member of Board Committee of Museum of Criminology

E-mail: [mstefan\(at\)med.uoa.gr](mailto:mstefan(at)med.uoa.gr)

Sotiris ATHANASELIS

Associated Professor in University of Athens and Member of Board Committee of Museum of Criminology

E-mail: [sathan\(at\)cc.uoa.gr](mailto:sathan(at)cc.uoa.gr)

Chara SPILIOPOULOU

Associated Professor in University of Athens and Member of Board Committee of Museum of
Criminology

E-mail: [chspiliop\(at\)med.uoa.gr](mailto:chspiliop(at)med.uoa.gr)

The exhibition of scientific principles: a case study from the Biological Sciences Museum at Macquarie University

MORWENNA PEARCE & ANDREW SIMPSON

Abstract

The educational role of museums requires that exhibition practice be informed by sound scholarship. In a university science museum, exhibitions should deploy objects and use space in a way that exemplifies the scientific principles that underpin learning and teaching programs of the host department or faculty. In this paper, a form of diacritical analysis of a number of individual exhibitions in the Biological Sciences Museum at Macquarie University is applied to elucidate these scientific principles. The analysis has significance when considering potential audiences. Visitors to the museum who are enrolled as undergraduates within the host department will bring existing knowledge to the museum. In this example, students should have existing knowledge of evolution, adaptation and comparative morphology. Other visiting audiences may not. Therefore, a university museum that wishes to engage with audiences beyond the discipline-specific student body need to strike a balance and carefully frame their exhibition work in a way that does not alienate those already familiar with the underlying principles of the didactic content. It is proposed that this form of pedagogic methodology can be constructively applied to inform exhibition work in other scientific disciplines.

Introduction

It is well established that museums, through their exhibition work, attempt to impart much more than didactic content (MACDONALD 1998). Their historical development as engine rooms of knowledge has also been elucidated (BOYLAN 1999) and the role of contemporary museums as mediators of informal learning experiences is similarly well established (HOOPER-GREENHILL 1994; FALK & DIERKING 2000).

In science exhibitions, objects or specimens are decontextualized and presented in alignment with others, and interspersed with additional contextual material, in a way intended to evoke certain didactic principles representative of accepted scientific paradigms. Much of the literature on this is focused on individual examples and couched in terms of the achievement of successful audience outcomes (e.g. MCLEAN & MCEVER 2004). Asma (2001) presented a comparative analysis of exhibition methodologies in major national natural history museums that indicated methodological diversity driven by cultural perspectives for exhibitions centered on the globally accepted scientific paradigm of evolution. These institutions engage with large and diverse audiences, their exhibition strategies are often emotional audience engagement rather than imparting didactic content. Hein (1996, 297) makes the point that “the pleasure of losing oneself in that experience displaces the desire to know the reality that it purports to explain”.

University museums, however, have a more complex relationship with their respective audiences. Whilst they can be viewed as enabling an aesthetic experience that generates audience interest, often viewed by university administrators as a recruiting function, they are also often designed to inculcate didactic content in support of formal teaching programs.

This paper reviews the exhibition methodologies used in the display of scientific principles within the Biological Sciences Museum at Macquarie University. The museum collection developed over a period of 40 years as a result of teaching programs in Biological Sciences at the University. It has only been in the last 20 years that the collection has had a dedicated but small exhibition space. The museum utilizes traditional natural history exhibition techniques and hosts visits from a number of school groups visits primarily from adjacent geographical areas (approximately 600 students per annum – unpubl. data). The number of annual external visitors is roughly equivalent to the current

undergraduate cohort studying a suite of academic units some of which use the museum's exhibition resources in formal classes, but many of these units don't integrate the museum into formal teaching time. The museum is also utilized by some academic units outside of the biological sciences, principally early childhood studies, museum studies and visual arts. The museum is occasionally used as a showcase for visiting delegations to the university particularly those with biological or general science interests.

The exhibitions that are discussed in this paper are *Human Development*, *Phylum Arthropoda*, *Molluscs*, *Skull Adaptations of Mammals*, *Locomotion and the Vertebrate Skeleton*, *the Australian Ark* and *Specimens in Jars*. The paper consists of a diacritical analysis that includes an interpretation of the effectiveness of each exhibition based upon how directly and overtly scientific principles are communicated visually via the design of each exhibition. As the undergraduate student clientele comprise a specialized audience of university museums, these can be directly mapped against learning outcomes in undergraduate unit study guides.

The Biological Sciences Museum at Macquarie University has a strong design aesthetic with standardized red and green colors within the exhibition furniture and consistent interpretive text panels. The red and green colors are intended to be representative of the faunal and floral biological realms. This gives the museum a distinctively different atmosphere from laboratories and other teaching spaces within the Biology precinct.

Human Development exhibition

The exhibition on human development is the one that most effectively communicates its scientific principle within the museum. This display shows the process of human development in two ways. First and foremost, the time taken for development is shown through the use of exhibition space. At one end of the exhibition, there is a preserved embryo at seven weeks of age and at the other end of the display there is a preserved fetus aged 21 to 24 weeks, with an additional six stages represented in



Fig. 1 - *Human Development* exhibition. The use of horizontal space, still photographs, developmental series, a timeline and text combine to effectively communicate the exhibition's underlying scientific principle.

between. Furthermore, still photographs are used to fill in the missing stages extending from conception through to an eight month old fetus. A timeline along the top of the exhibition also graphically interprets the different stages of human development. By using horizontal space to represent time, the exhibition effectively narrates the stages of development in a chronological fashion. Secondly, human development is exhibited through the use of comparative biology. Alongside the human embryos and fetuses are the developmental series of the domestic chicken and the brush tail possum. The positioning of these developmental series beside the human developmental series allows for visual comparisons to be made by the

visitor whilst still addressing the unifying embryological principles. Fig. 1 illustrates how these elements have been combined to produce an effective, scientific exhibition.

The use of exhibition space to represent chronology is a standard natural history interpretive technique. Progressive embryological development for the visitor runs from left to right. Space can be related to chronology in exhibitions by either an indicative or representational method. In this case it is representational as the time span can be subdivided into components of equal space. The indicative

method is more commonly used when interpreting extensive time spans, such as geologic time, where space restrictions and content are skewed towards specific time intervals (e.g. SIMPSON 1998) towards one of the time span represented.

The exhibition text identifies the three stages of human development – pre embryonic, embryogenesis and fetogenesis – and lists the milestones of each stage. It is left up to the visitor to identify exactly when within the displayed human developmental series these milestones occur. Not dictating this information provides a means by which a visitor can be actively engaged with the displayed material.

The exhibition text also highlights the effects of environmental influences on human development, with a particular focus on drugs, both those that are illegal such as heroin and LSD and those that are socially acceptable such as alcohol, nicotine and caffeine. The developmental issues raised in the text are not visually represented, and given the sensitive and distressing nature of the topic being exhibited, this is the responsible approach for the museum to take. The exhibition text brings a political and socio-cultural element to the exhibition by reminding visitors that a parent's responsibility begins before the birth of their child by minimizing the harm that environmental influences can have upon their unborn child. This therefore raises the question of the right of an exhibition curator to decide on who are responsible and irresponsible parents by invoking an ethical conceptual judgment.

Although this exhibition is about a scientific principle, and human fetuses are displayed in the name of science, there will be people that object to the use of human remains in an exhibition for variety of reasons. Furthermore, whilst this exhibition is merely presenting the scientific facts surrounding human development, for some, this display will be more emotive than scientific. Due to the sensitive nature of the display, it is therefore wise to have the exhibition off to the side where it is not in a visitor's direct line of sight when entering the Biological Sciences Museum. The exhibition of human remains is a diverse practice (TOWNLEY 2000) and a complex ethical question (LUCAS 2000). This exhibit is one of the most popular with external visitors and always prompts strong reactions. Beyond it's use in the teaching of embryological development in the biological sciences, it is most useful as a museological construct in the delivery of museum studies programs.

***Phylum Arthropoda* exhibition**

The *Phylum Arthropoda* exhibition attempts to interpret the scientific principles of evolution and diversity. Whilst it does highlight the diversity within the arthropods, the evolution side of the exhibition is not interpreted in a particularly convincing manner.



Fig. 2 - *Phylum Arthropoda* exhibition. By confining the phylogenetic tree to one end of the exhibition, the viewer loses sight of the evolutionary relationships. By extending the tree through the entire exhibition and placing the shelves along the tree at different heights, evolutionary relationships would be further developed.

Within this exhibition, the only tool used to highlight evolution is the phylogenetic tree, as seen in fig. 2. To a visitor with little knowledge of biology, a phylogenetic tree is of little help explaining the evolution of the arthropoda. Here, phylogenetic distance is represented by exhibition space. This is possibly arbitrary as phylogeny can be interpreted by either molecular or morphologic means sometimes with differing results.

This exhibition is therefore designed with the biologist in mind. The text below the phylogenetic tree didactically describes what the tree is

attempting to depict visually; that is, despite their diversity, arthropods come from a common ancestor. As one moves along the length of the exhibition, one loses sight of the phylogenetic tree as it only extends through one third of the exhibition space. This makes it very difficult for the viewer to see the origin of each of the arthropod classes and their relationships with other classes. In order for the scientific principle of evolution to be developed further within this exhibition, it is suggested that the phylogenetic tree forms the backdrop of the exhibition, going for its entire length. This way, the text on each class and the associated specimens can be slotted in along the appropriate branch of the phylogenetic tree.

The time taken for the evolution of the arthropoda would therefore be displayed through horizontal space, which as previously mentioned, is an effective means of display when representing time and order. The use of the phylogenetic tree however in this manner will not solve the problem of providing information on evolution to the visitor that is not armed with pre-existing biological knowledge. Interestingly, studies of visitor understanding of evolution in a museum context show distinctively different preconceptions depending on the organisms involved (SPIEGEL ET AL. 2006). In general, some of the most creative exhibition methodologies tend to focus on the question of human origins (SCOTT & GIUSTI 2006) rather than the relationships of humble invertebrates.

Asma (2001) describes the American Museum of Natural History where the representation of phylogeny comes out of the display case and onto the floor plan of the museum. Given the audience diversity at this museum, it would be interesting to gain some insights into the visitor conceptions of the underlying scientific principles enmeshed in the floor plan.

The scientific principle that the *Phylum Arthropoda* exhibition does explore and display effectively is diversity. The arthropoda represented within the exhibition include eurypterids, trilobites, onychophorans, crustaceans, myriapoda and hexapoda. Each of these is described in some detail in small text panels, with particular attention being paid to the distinguishing features of each group of organisms. Specimens or photographs are placed above the text in order to physically represent the articulated characteristics. At no point within the exhibition is there a labeled specimen with all the characteristics clearly indicated. The visitor is instead left to identify these features for themselves. This is a process that is only suitable for those that are capable of interpreting visual biological data. It is very difficult to identify these distinguishing features of the specimens, however, if they are absent from the exhibition as was the case with the hexapoda and the myriapoda. It must also be remembered that due to limitations of space, the diversity of arthropoda represented within this exhibition is at a subphylum level and as such, it is a highly selective and constructed sample of the diversity of the whole phylum down to species level. Better utilization of the exhibition space, such as the inclusion of more shelves to display specimens would allow for an increased diversity to be exhibited.

***Molluscs* exhibition**

The *Molluscs* exhibition effectively communicates the scientific principles of class diversity and functional morphology, by focusing on the single shelled gastropods. Due to the limitations of space, focusing on one class is appropriate as neither the space, nor the collections resources can do justice to the diversity and functional morphology of all classes. There is no divide in this exhibition between diversity and morphology with the two being displayed in association with one another. These scientific principles are primarily explored through the shell of the gastropod with only fleeting references to soft tissue made in the text. This implies that when biologists deal with the diversity and functional morphology of gastropods, the soft tissue is not a discriminating factor between organisms.

The two main ways by which the scientific principles are explored within this exhibition are through the use of text and the use of specimens. In this exhibition, the text is kept to a minimum. The visitor is provided with a small amount of information regarding the mollusc phylum, with the remainder of the



Fig. 3 - *Molluscs* exhibition. Small clusters of shells are used to illustrate diversity within species and diversity between species.

text focusing on gastropods in general and the functional morphology of gastropod shells. It is this text that provides an explanation for the visible differences between the gastropod shells. Without it this exhibition would just be a display of aesthetically appealing shells, rather than one that involves any scientific principles. The specimens are what tie both scientific principles together. The gastropod shell specimens are the physical manifestations of the morphologies mentioned in the text, such as spines, flattened tent shapes and spires. Each morphological type is represented by a cluster of sample specimens, as seen in fig. 3. Diversity is not only shown by

comparing individual families and species but also by comparing individuals within a particular species using characteristics such as size, color and patterning.

The use of clusters containing numerous specimens of the one gastropod shell type within the exhibition is an effective way to visually establish this diversity between individuals. This methodology therefore provides a visual basis for an important principle in understanding Darwinism. While this exhibition tactic may miss the mark with many visitors lacking a pre-existing understanding, it does provide a framework for contemplating the relationships between individuals and groups of individuals. Like the *Phylum Arthropoda* exhibition, the viewer is left to make one's own connections between the text and the specimens. The text is continually drawing the viewer back to the exhibit to see an example of the gastropod being elucidated.

In order for the functional morphology side of the exhibition to be improved, rather than just dictate the morphological adaptations, it would be useful to have diagrams or photographs showing the gastropods in situ. Without such diagrams or photographs, it is hard for those that have never encountered such gastropods to imagine where they would be situated in nature. Rather than just connecting to those with a specialist knowledge of gastropods, such visual ecological parameters would connect this exhibition with a broader audience. Without such an ecological parameter, this display probably seems decontextualized and meaningless to a non-biologist visitor.

***Skull Adaptations of Mammals* exhibition**

The scientific principles investigated in this exhibition are adaptation and comparative anatomy, with a focus being on how mammal skulls have adapted for different feeding habits. The different categories of mammal of particular interest in this exhibition are monotremes, marsupials and placentals and the adaptations of the skull that are specifically dealt with are the brain case, jaws and teeth.

The comparative anatomy side of this exhibition is explored through the use of skull specimens and the exhibition text. By placing the skulls side by side, the visitor is provided with a means by which to compare the size and shape of different skulls and the size, shape and number of teeth. Whilst some of these differences are explained in the exhibition text, it is very much left up to the visitor to make comparisons and determine reasons for the differences and similarities observed. The visitor is therefore invited to become actively engaged with the skull specimens. This is done by suggesting the visitor look for particular differences between skulls, such as the enlarged cerebral hemispheres in

primates. Furthermore, the visitor is continually drawn from the text to the skull specimens in order to acquire a visual representation of what is presented as didactic text – for example, the large canine teeth discussed in the text can be seen on the tiger and jaguar skulls.

This exhibition stands out from all others in the Biological Sciences Museum as it uses diagrams to highlight differences in musculature and jaw bone configuration between different groups of organisms. Without these diagrams, the visitor would be overwhelmed with scientific jargon unrelated to anything visual. However, in order for the visual side of this exhibition to be improved, there needs to be diagrams of teeth or labels on the skull specimens highlighting the different types of teeth. Without such labels, it is assumed that the visitor has some prior knowledge of mammalian biology. A visitor cannot make comparisons of different teeth and their function if they are unsure of what they look like.

One other point of improvement would be to link all the skull specimens up to the text. As the exhibition currently stands, there are skulls on display such as the black rhinoceros, common zebra and wild boar, that although they are interesting to look at, they play no role in advancing the exhibition's line of argument. At the same time however these skulls do add to the comparative anatomy side of the exhibition. It would also be more helpful for the visitor if the skulls on display were directly above the text in which each organism was mentioned – the platypus jaw is currently placed above the discussion on brain case size when it would be more beneficial situated above the text on monotreme jaws.

In many ways this exhibition is a three dimensional representation of illustrations from a biology text. The lack of diagrammatic contextual material implies a pre-existing level of biological knowledge is required of visitors. It is structured however in a way that will challenge visitors without such knowledge to consider the concept of homology through form and function.

Locomotion and the Vertebrate Skeleton exhibition

This exhibition explores the adaptations that vertebrates have utilized in order to undertake locomotion. The methods of locomotion addressed are flight, loss of limbs, bipedal hopping and cursorial locomotion of quadruped animals. The use of skeletons to support each adaptation also allows for the scientific principle of comparative anatomy to be investigated.

The scientific principle of adaptation is clearly explained in this exhibition through a combination of text and skeletal specimens. The text very clearly and simply describes each method of locomotion whilst also highlighting the main adaptations needed for each particular method of locomotion. By listing these adaptations, rather than specifically pointing them out on each skeleton, it is very much the responsibility of the visitor to locate them on the skeletons. As previously argued, this provides the visitor with a means of being actively involved in their museum experience. Where possible, the skeletons have been displayed in association with their habitats – the snake skeleton is curled around a tree branch and the koala skeleton is nestled in the fork of a tree. By displaying the skeletons in such a manner, the exhibition dictates that adaptations for locomotion have allowed for the utilization of specific habitats by different organisms. Whilst each adaptation could be represented by any number of organisms, the small amount of space has limited the number of displayed specimens to one per adaptation. In most cases, one skeleton is effective in illustrating each adaptation, yet for those organisms that have adapted to limbless locomotion, there are a variety of bodily forms that these organisms can have. By including a fish skeleton and utilizing the whale skeleton hanging from the ceiling of the museum, the scientific principle of adaptation would be surveyed at a greater depth.

Comparative anatomy is explored within this exhibition in two main ways. Firstly, the skeletons provide a means by which the visitor can compare different vertebrate skeletons as a whole, identifying

features that are common to all vertebrates, such as the vertebral column and a rib cage. Secondly, the skeletons allow the visitor to establish how individual skeletons compare to one another as a result of the different modes of locomotion. Whilst the exhibition text states the differences, it is only by viewing the skeletons that the visitor can fully comprehend the skeletal differences needed for different methods of locomotion.

Putting the exhibition in chronological order by representing time across horizontal space, with the most primitive condition for locomotion first, moving through to the most recent form of locomotion would greatly improve this exhibition through the addition of context. As the exhibition currently stands, it is difficult for the visitor to establish how each adaptation for locomotion developed and evolved from



Fig. 4 - *Locomotion and the Vertebrate Skeleton* exhibition. Additional environmental context is provided for some specimens.

a pre-existing condition. Chronological order would therefore also allow for the scientific principle of evolution to be represented. One section of the exhibition that is in chronological order is the cursorial locomotion of quadruped mammals. It is this section of the exhibition that clearly communicates how the different forms of locomotion have developed and evolved.

As with the skull adaptations of mammals, this exhibition (fig. 4) can also be considered a three dimensional representation of a biological text, the environmental context utilized within the display space, however, makes this one more accessible for the non-biologist.

Australian Ark exhibition

There are three sections to this exhibition – Australian mammals, Australian water birds and Australian reptiles, with each section attempting to explore the scientific principles of endemism, adaptation and diversity.

The scientific principle of adaptation is evident in the Australian mammal and Australian water birds sections of the exhibitions. Much of the text in the Australian mammals section focuses upon the different adaptations these organisms have developed as a result of exploiting specific habitats. The display of taxidermy specimens in their life habitat further supports this notion. Within the Australian water birds section the adaptations needed for different habitats and lifestyles are highlighted in terms of feet, bills and coloring. The text elucidates the differences between these particular features on different birds and why these adaptations have evolved. The taxidermy bird specimens provide a way of physically representing these different adaptations. The text and specimens are very closely linked with each bird mentioned in the text being represented by a specimen. The scientific principle of adaptation is therefore effectively conveyed through the display by standard techniques of specimen and text.

The scientific principle of diversity is most clearly illustrated in the Australian reptile section of this exhibition. The exhibition text here highlights that Australia is home to many different species of crocodiles, turtles, lizards and snakes and the accompanying specimens illustrate this diversity through varying sizes, shapes and coloration. The exhibition is self contained within the cabinet and unfortunately does not attempt to integrate or in fact make any use of a large turtle specimen hanging on the wall next to this section of the exhibition. Not only would this increase the diversity of specimens already represented in the exhibit, but it would also utilize a specimen that currently

appears to serve no educational purpose despite occupying a significant space in a visually striking manner.



Fig. 5 - *Australian Ark* exhibition. This exhibit assumes knowledge of endemism.

The introductory text to the *Australian Ark* exhibition mentions the unique nature of Australian fauna which suggests that the exhibition is exploring the scientific principle of endemism (fig. 5). The remainder of the exhibition however, very much assumes that the visitor knows that due to its isolation, Australia has native fauna that cannot be found anywhere else in the world. Whilst it is probably safe to assume that most visitors would be aware of Australia's unique mammals, it is important to stress that Australia has water birds and reptiles that are also endemic species. Without any

development of contextual material about the nature of endemism, the exhibition can be easily just considered a display of mammals, water birds and reptiles that are present in Australia and possibly in the rest of the world. The use of a larger introductory text panel and the use of maps to show the distribution of each organism represented within the exhibition are two ways that greater coherency between the exhibition as a whole could be improved thus further developing the visitor's understanding of the scientific principle of endemism

***Specimens in Jars* exhibition**

The *Specimens in Jars* exhibition demonstrates the importance of wet specimen preservation for the keeping of biological specimens. Whilst not a scientific principle, it is a technical methodology that is inherent to all museums and collections dealing with natural history. The value of this technique to natural history collections and therefore the history of much basic research on the natural world will not be readily apparent to a non-biologist viewing this exhibition. There is no coherent theme to the specimens on display, they include everything from cuttlefish to sheep tape worm and it does appear that this exhibit was one method of simply filling shelves within the museum. That being said, the material on display in this exhibition provides the visitor with a sense of wonder. There is no text other than specimen labels and as such it is left to the visitor to contemplate and appreciate the specimens without distraction.

No other preservation technique preserves specimens in such a life like and complete manner and as such the specimens can be appreciated for how they were in life. Such an exhibition provides the visitor with the opportunity to see organisms they may not have previously encountered – there would be no other way that a viewer would be able to encounter a chimera, a fish that lives at depths of over 4,000 meters below sea level other than in such an exhibition. There is therefore an “other worldliness” to the material on display that is well beyond normal human experience. Despite not demonstrating a scientific principle or having a coherent theme, this exhibition is worthy of a place in the Biological Sciences Museum as a result of its aesthetic nature.

Conclusion

The Biological Sciences Museum at Macquarie University explores numerous scientific principles including evolution, adaptation, human development and functional morphology. These principles are all explored through a variety of exhibition methodologies including didactic text, specimens, pictures and diagrams.

The Department of Biological Sciences at Macquarie University offers a diverse range of study units in its undergraduate program. Foundation units during first year (100 level units) have the largest enrolments as many students undertaking a study major elsewhere in the sciences will include 100 level biology units. Second year units (200 level units) cover more advanced and specialized biology topics. Third year units (300 level), a combination of which comprise a major in biological sciences, cover the most advanced and highly specialized study units.

The Department offers five 100 level units (2009 offerings). Two of these are in a separate advanced biology seminar stream and structured differently from the other three (although the content of seminars can often relate to museum content). These three act as broad-based introductory units that traditionally have relatively high enrolment numbers. The units *The Thread of Life* and *Evolution and Biodiversity* strongly relate to the content of all the exhibitions discussed above. The third introductory unit *Human Biology* strongly relates to the *Human Development* exhibit, but less so to the others discussed here.

Eleven units are offered at 200 level, two of which are delivered through the advanced biology seminar stream. The remaining nine include two units entitled *Plant Structure and Function* and *Biostatistics* that seem to have little or no connection with the didactic content of museum displays. The units *Genetics*, *Ecology* and *Tropical Marine Ecosystems* have little direct connection with the museum exhibitions although exemplars illustrating some of the learning outcomes of these units are embedded in museum exhibitions. The units *Human Physiology* and *The Science of Sex* obviously relate directly to the *Human Development* exhibition. Of the remaining 200 level units, *Palaeontology* links in part to phylum arthropoda evolution exhibition and animal structure and function links in part to both the phylum arthropoda evolution and the *Molluscs* exhibition (this unit is primarily focused on invertebrates).

At 300 level 21 units of study are offered. Here the content is more specialized and the value of the museum exhibits to learning outcomes more tenuous, although some strong linkages still exist. For example the units *Invertebrates: Evolution, Behavior and Diversity* is linked to both the *Phylum Arthropods* and the *Molluscs* exhibitions, though it can be argued that their utility in terms of learning outcomes has been largely expended at 200 level. Other units such as *Vertebrate Evolution* find some indicative value in the *Skull Adaptations of Mammals* and the *Locomotion and the Vertebrate Skeleton* exhibitions.

From a cursory analysis of unit content it is obvious that the museum is of most value for the small number of introductory units (100 level) with high enrolment numbers and of less value to more specialized, advanced units of study. This “pyramid” model of connections best serves the undergraduate teaching goals by connecting with the broadest possible student clientele.

As noted above, however, there is also an external audience of approximately the same size as the enrolled student audience for the museum. The analysis above clearly demonstrates that some form of pre-existing biological knowledge is required to fully engage with the museum exhibitions. The part of the external audience that consists of high school students studying biology at senior levels could realistically be expected to have some of this knowledge and engage with the exhibition content at some levels. But little is known of the diversity of the external audience and some analysis is required to ascertain whether the museum exhibitions connect effectively.

Any museum visitor, regardless of levels of pre-existing knowledge, however, does not come to a museum as a blank slate. They come to build on what they already know to create new meaning. For those without previous exposure to biological concepts this new meaning can include reinforcing scientific misconceptions. Therefore, to reach this part of the museum’s audience, it is worth

considering additional contextual material as learning scaffolding in exhibition development. If the university's mission does not include engagement with this audience segment, then such work is obviously not essential. This, however, is contrary to recent trend of audience inclusion in the work of the broader museum sector.

The suggested improvements for the exhibitions would provide the visitor with a greater understanding of the above-mentioned scientific principles regardless of their pre-existing knowledge, whilst also enhancing the use of the museum's resources. It now needs to be established how effectively the exhibitions contained within the Biological Sciences Museum and the scientific principles they explore relate to the teaching of the Department of Biological Sciences at Macquarie University through closer analysis of individual learning outcomes for specific units of study.

It is suggested that the methodology adopted in this paper can be applied to any university science museum. Through a meta-analysis of the scientific principles underpinning exhibition development, an understanding of the different audiences served by the museum, and mapping the results against learning outcomes, the museum has developed a mechanism for leveraging the maximum potential from its exhibition work in support of teaching programs.

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Contact

Morwenna Pearce

Student, Museum Studies Program

Address: Macquarie University, Department of Environment and Geography, NSW 2109, Australia

E-mail: morwenna.pearce(at)students.mq.edu.au

Andrew Simpson, PhD

Director, Museum Studies Program

Address: Macquarie University, Department of Environment and Geography, NSW 2109, Australia

E-mail: andrew.simpson(at)mq.edu.au

The Museum Collections of Craft Teacher Training. Cultural heritage serving education and research

JAANA TEGELBERG

Abstract

Craft science only got its name in the early 1990s. Its field of research combines science, art and technology. The Collections of Craft Teacher Training in the Helsinki University Museum present the link between tradition and modern science.

The first school of women's handicraft in Finland was opened in Helsinki 1881, and four years later the teacher training was started at the school. In 1975 the school was integrated with the University of Helsinki, and today the section of craft science and textiles teacher education has two professorships.

The teachers in the school collected and donated textile objects for teaching demonstrations and research. Today the collections comprise some 6,000 objects ranging from adults' and children's clothing accessories to textiles made by using various techniques. The oldest of these textiles date from the mid-1800s.

In 2003 the Museum Collections of Craft Science were transferred to the Helsinki University Museum. The collections are now taken care of by professional museum staff in close cooperation with craft science lecturers. The lecturers still use the collections in their teaching and research, and theses have been made about museum textiles. The collections are used in teaching designing and making of textiles, costume and textile history, and object-based research to examine crafts skills in different periods, the relationship of such skills to art and fashion as well as the relationship between hand-made and machine-made objects. This collection is, in fact, one of the rare museum collections in the Helsinki University, which still are in educational and scientific use.



Fig. 1 - Idi Lindholm teaching the secrets of genuine lace in 1941.

The museum collection as a tool

Studies in textiles teacher education combine manual skills and scientific and applied subject-specific knowledge with pedagogical skills. The majority of textiles teachers are employed in the educational sector as teachers. Graduates from the education also work in retail, industry and media. The key aim of textiles teacher education is to ensure that crafts and crafts skills remain part of general education and lifelong learning. Crafts can be used to develop creative and cognitive processes, such as planning skills and problem-solving, as well as organization and evaluation of work.

One of the challenges of the handicraft teachers is to convey knowledge of our ancestors' handicraft skills. The Helsinki University provides web-based material in a tool called *ApuMatti* (helpful Matti). There are also interior textile course materials produced by the craft science and textiles teacher education section: pictures and information about old bed textiles from the Craft Science Museum collections. Through studying museum material, e.g. bridal handicrafts, which were made by hand and

with love for the daughter of the family, the future school teachers learn cultural history (SAARINEN & KUUKKA).



Fig. 2 - Corset from ca 1900.



Fig. 3 – Helsinki School of Handicraft presented a silk case for writing implements at the Paris World's Fair in 1900.

The textile collections offer opportunity to study manual skills as well as the history of fashion and design (KOSKENNURMI-SIVONEN & SALO-MATTILA 2009). Courses presenting the history of women's dresses and evening gowns are held in museum by PhD Ritva Koskennurmi-Sivonen, who has studied the creations of fashion designers. Creating a unique dress is a multimethod case study which bridges the past and the present in investigating individual, handcrafted dresses. Unique dresses and dressmaking are studied in relation to fashion, craft, and their overlapping field which is often referred to as *couture*. Central to the study are the designing and making-up processes, products, and the clients' conceptions of their dresses and their patronage of the 'couturière' (KOSKENNURMI-SIVONEN 1998; 2002).



Fig. 4 - Woman's coat from 1960s, designed by Ulla Bergh.

Education, fashion and craft

The museum pieces in the Collections of Craft Teacher Training represent the training's own history. Since 1881, the teachers themselves have made, collected and donated objects for demonstration in teaching. In regard to outside donations, the teachers have decided what should be kept and what to be given up. Former students have made and donated a large number of the items. The collection also includes tools and implements used in handicraft.

Dressmaking, linen garment sewing and needlework were the three first courses offered at the Helsinki Craft School. These skills were necessary because the majority of dresses, linen garments and knitwear were made by hand. A separate group of the museum collection comprises the almost 600 half- and full-scale models of garments made by teachers and students for teaching purposes. Their chronological distribution reflects how the importance of sewing skills decreased in instruction:

most of this material is from the 1920s to 1940s, and only a few items come from the last few decades (KOSKENNURMI-SIVONEN & SALO-MATTILA 2009; SALO-MATTILA 2000).

The museum collection was established in 1959 when a room was given for the collection, and another one for the curator. First curator, history of handicrafts teacher Hilda Kontturi began to arrange the gathered material. The museum objects were numbered and the corresponding cards were prepared. In 2000-2002 new museum technology was introduced: digital database was created and the most important objects were photographed (SALO-MATTILA 2003).

The Helsinki University Museum was established in 2003 by merging the former university museum specializing in the history of the University of Helsinki, the Collections of Craft Science, the Museum of Medical History, the Museum of the History of Veterinary Medicine and the Museum of the History of Dentistry. From the Collections of Craft Science is on display for example a case for writing implements, which was presented at the Paris world's fair in 1900. The case with embroidery on silk was designed by Helena Westermarck, a teacher at the Helsinki School of Handicraft and a painter. The special exhibition *Close to the Skin* offers a peek to the history of the nightwear and underwear. All the objects in the special exhibition are from the Collections of Craft Science.

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Contact

Jaana Tegelberg

Head of Collections, Helsinki University Museum

Address: PB 11, 00014 Helsinki University, Finland

Email: jaana.tegelberg@helsinki.fi

www.museo.helsinki.fi/english/index.htm

Object-based learning in higher education: The pedagogical power of museums

HELEN J. CHATTERJEE

Abstract

Following a special conference focused on object-based learning in higher education at University College London (UCL), this paper provides the overview for a series of subsequent papers which explore the value of object-based learning, including the pedagogical framework for museum learning in the university classroom and practice led examples from a range of disciplines. Object-based learning in higher education draws on many of the learning strategies already known to inform students, including active learning and experiential learning; this collection of papers draws together examples of object-based learning pioneered at UCL and seeks to encourage enhanced use of university collections in new, pedagogically powerful, modes.

Introduction

Museum collections afford a valuable opportunity to provide a focal point for acquiring subject specific knowledge – imagine teaching about the difference between sedimentary and igneous rocks without ever looking at a geological specimen. Objects can also be used to inspire discussion, group work and lateral thinking – all essential key, transferable, skills in higher education. University collections comprise a wealth of information, documenting the historic rise of disciplines and representing cultural and natural diversity from across the globe. University collections were pioneers in object-based learning and most university collections were formed as teaching collections. Object-based learning was an integral part of the student experience in 19th and early 20th centuries; but many universities, including UCL faced a downturn in favor and use in the later 20th century. This paper introduces a series of papers exploring object-based learning in the 21st century within the higher education sector, offering examples of best practice from university teachers, plus papers drawing on learning theory to contextualize object-based learning within a pedagogical framework.

In April 2009 University College London (UCL) hosted a special study day devoted to object-based learning (OBL) in higher education. Organized by UCL Museums & Collections (M&C) the day attracted 70 delegates from across UCL and the wider higher education and museum sectors. The purpose of the event was to showcase the varied OBL activities and resources developed at UCL in recent years, based around UCL's outstanding museums and collections. One of the key aims was to promote UCL M&C as providers of top-class higher education learning opportunities and resources to academics in the region. Through case-studies and theory-based participative and traditional conference sessions, the desired outcome of the gathering was to encourage an increased use of university collections in teaching.

Background: OBL and UCL Museums & Collections

Museums, and the collections they house, are fascinating places – home to amazing artifacts, beautiful artworks and fascinating specimens. UCL is home to 3 public museums, the Petrie Museum of Egyptian Archaeology, the Grant Museum of Zoology and the Strang Print Room, and around 15 departmental collections covering archaeology, anthropology, science and medicine (UCL MUSEUMS AND COLLECTIONS 2006). Totalling a third of a million objects UCL's collections comprise a wealth of information documenting the historic rise of various disciplines, such as chemistry, earth sciences, zoology and archaeology and representing cultural and natural diversity from across the globe. UCL's collections are used in teaching, research and public engagement.

The Petrie Museum is one of the greatest collections of Egyptian and Sudanese archaeology in the world. The museum was founded by Sir William Flinders Petrie who is often termed the father of Egyptian archaeology and who became the first professor of Egyptian archaeology at UCL. With over 80,000 objects, the museum boasts a series of firsts housing the earliest examples of metal and glazing from Egypt and the earliest pieces of linen from Egypt.

UCL Art Collections were started in 1847 with a gift of sculpture models from John Flaxman. The collection is continually growing as it houses the prize winning student artworks from the Slade School of Art including works by: Stanley Spencer, Augustus John and Gwen John.

The Grant Museum of Zoology includes over 50,000 skeletons, wet specimens, fossils and taxidermy animals. One of the few remaining zoology museums in London the collection is home to several rare and extinct specimens including dodo, quagga and Tasmanian tiger remains.

Departmental collections cover disciplines from pathology through to archaeology. The science collections (including disciplines such as physiology and chemistry) demonstrate the enormous contribution UCL has made to the advancement of science at a worldwide level, such as the first ever X-ray photograph that was used for clinical purposes.

Objects can be employed in a variety of ways to enhance and disseminate subject specific knowledge, to facilitate the acquisition of communication, team working, practical, observational and drawing skills, and for inspiration. Museums and the objects they house also afford a unique opportunity for cross disciplinary study with collections providing inspiration for students studying art, design, architecture, philosophy, languages, history and social sciences. The true pedagogical value of OBL is only recently being realized as museums enjoy somewhat of a renaissance in use for educational purposes.¹ But what is the value of OBL in higher education?

Through creative collaborations with academics within the university and innovative student-focused object-led projects (e.g. NOBLE & CHATTERJEE 2008; WERE 2008; CHATTERJEE & NOBLE 2009; CHATTERJEE 2009) a key strategic priority for UCL M&C has been the wider integration of OBL in UCL's rich and varied curricula.

OBL at UCL: What we offer and why

This volume includes papers from OBL users (including Dr Rachael Sparks, UCL's Institute of Archaeology; Dr Joe Cain, UCL Science and Technology; Guy Noble, University College London Hospital) and providers (such as Simon Gould, contemporary projects curator, UCL M&C) and interactive sessions covering PBL (problem-based learning), EBL (enquiry-based learning) and skills acquisition. Colleagues from UCL's Centre for the Advancement of Learning and Teaching (Drs Rosalind Duhs and Jenny Marie) discuss the role of OBL in the acquisition of key, transferable, skills and in enhancing student understanding of threshold concepts and troublesome knowledge; two projects they are working on with staff at UCL M&C following the award of CALT Academic Development grants to the author (HC). The papers include case studies, highlighting best practice in specific classroom scenarios from OBL advocates (e.g. Nobel & Cain) outside of the formal university museum staff, to essays exploring the underlying pedagogical power of OBL (e.g. Duhs & Marie). These papers demonstrate the wide potential of OBL to provide new ways for students to engage in their own learning, be it within disciplines, or across several disciplines, providing a source of inspiration within a framework of discovery, enjoyment and critical exploration.

¹ See Reading Museum's website for an example of best practice in a non-higher education setting: www.readingmuseum.org.uk/handson/learningandloans.htm (accessed August 15, 2009).

Conclusions

Objects have the power to inspire, inform, excite and educate; they can be used to acquire subject specific knowledge as well as more generic transferable skills such as communication and teamwork. This collection of papers offers a handful of examples of OBL in action and seeks to inspire enhanced use of the world's outstanding university collections in new and innovative ways. There are already numerous examples of good practice in OBL in other universities (see UMAC Journal 1/2009 for some excellent examples), but critically a key focus for the future must be to fully understand and articulate the value of OBL in higher education.

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Contact

Dr Helen Chatterjee

Director of Studies for Biological Sciences, Division of Biosciences and Deputy Director, UCL Museums & Collections

Address: Darwin Building, Gower Street, University College London, WC1E 6BT, United Kingdom

Email: h.chatterjee@ucl.ac.uk

www.ucl.ac.uk/biology

www.ucl.ac.uk/museums

www.museums.ucl.ac.uk/learning/touch_research/

Learning from university museums and collections in higher education: University College London (UCL)

Rosalind Duhs

Abstract

Object-based learning (OBL), drawing on the rich resources of university museums and collections, offers a way of leaping lightly over knowledge hurdles. At UCL, over 100 course units include OBL, translating into 2,500 instances of students working with the museum collections each year. Learners in higher education (HE) can be confronted with difficult topics which become obstacles to understanding, slowing down their learning. These obstacles often take the form of new concepts which may initially appear counter-intuitive. Misconceptions sometimes have to be unlearned before such challenging areas can be negotiated. Active student engagement with museum artifacts can facilitate such processes.

Introduction

The aim of this article is to provide an account of the pedagogical power of museum collections. Museum staff share a strong sense of the relevance of university museum objects to a range of academic disciplines, but surprisingly little appears to have been written on ways of using university museum collections to enhance student learning in HE. An explanation of why object-based learning is effective is provided and a method used to convey the potential of museums and collections to stimulate and inspire learners is described.

The pedagogical power of object-based learning

Why are learning activities which involve studying objects likely to be effective? In essence, learners cannot absorb complex knowledge in a meaningful way, leading to understanding, without processing it. Active learning, which centers on “what the student does” (BIGGS 2003), helps students to adopt deep approaches to learning. Research suggests that it is advantageous to create learning environments which promote intensely active student engagement with the subject they are studying (see for example PRINCE 2004; PUNDAK & ROZNER 2008). This engagement can be achieved by arranging learning activities for students rather than leaving them to listen passively to what the teacher says.

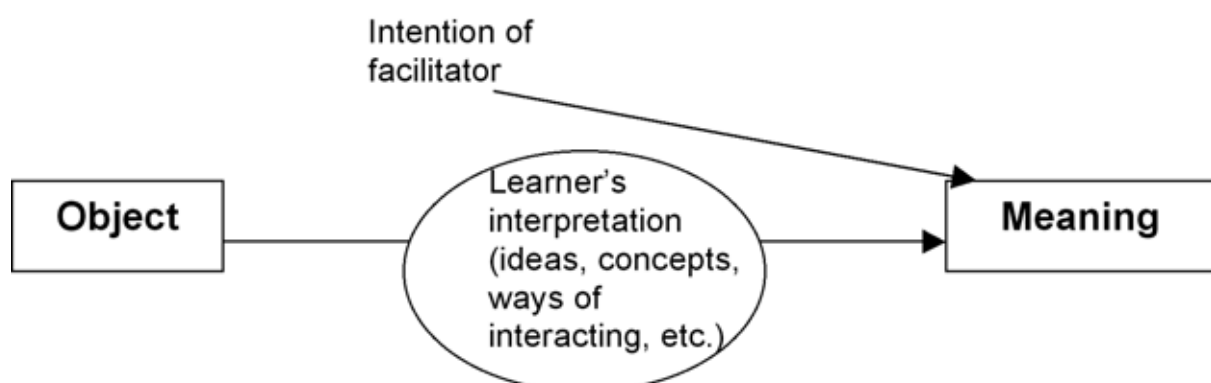


Fig. 1 - Objects and Meaning-making (based on ROWE 2002, 31)

The process of working with objects is illustrated in fig. 1. Handling the object involves the student in profound learning beyond the concrete artifact. As Paris suggests, “objects, although concrete,

actually represent a vast continuum of abstract ideas and inter-related realities" (2002, X). They therefore have the power to help students to cope with challenging aspects of the curriculum.

Multiple sensory modes and learning

Working with objects strengthens learning, as the sense of touch can lead to a more memorable learning experience. It has been established that "object-handling has a long-lasting effect and relationship with memory, more so than text-based learning often has" (ROMANEK & LYNCH 2008, 284). Biggs explains that "[The] more [teaching and learning activities] tie down the topic to be learned to multiple sensory modes, the better the learning" (2003, 80).

Teachers can plan learning activities based on the study of museum artifacts so that they involve all five senses, enriching and deepening learning. Interaction with fellow learners can stimulate an interchange of ideas about the object and help groups to respond to testing questions through enquiry-based learning exercises.

Experiencing how artifacts enhance learning

This example of how artifacts can support learning is based on a hands-on session for academic staff in HE and museum curators. The goal was to enable them to experience the impact of learning from objects first-hand. The theory underpinning the design of the session was adapted from Kolb's (1984) experiential learning cycle, illustrated in fig. 2 (and see MARIE 2010).

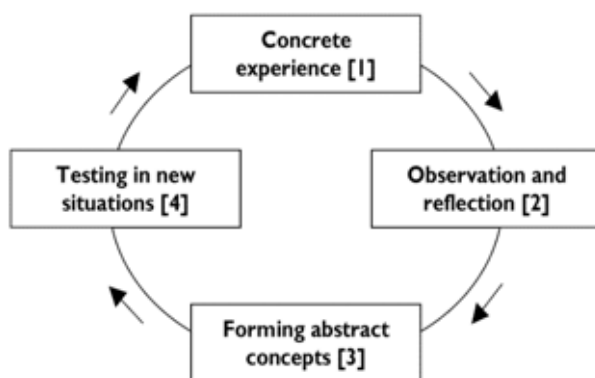


Fig. 2 - Kolb's experiential learning cycle

In this case, the application of Kolb's model to the learning session involved participants in experiencing a hands-on activity (concrete experience, 1), making reflective observations on the experience (observation and reflection, 2), building abstract concepts from their reflections (forming abstract concepts, 3), and planning how they might test or apply these concepts in the context of a teaching activity (testing in new situations, 4). The experience was arranged using objects borrowed from the Grant Museum of Zoology at UCL. Observations about the

learning which resulted from that experience were made in the groups which had handled the objects, and participants then had the opportunity to consider how object-based learning could be further expanded and integrated into the learning and teaching situations relevant to them.

Negotiating 'threshold concepts' and 'troublesome knowledge'

Meyer and Land's work (2005) focuses on difficult areas of knowledge. When they are understood, they can lead to a shift in learners' perception of a subject. They are so significant that they are unlikely to be forgotten, and they also reveal how apparently disparate aspects of a subject are actually interrelated. The acquisition of these transformative, irreversible, and integrative aspects of knowledge can be facilitated by studying artifacts. OBL can help learners through the borderline or liminal states which precede understanding. When they have negotiated threshold concepts, learners may extend their language, and develop further professionally, acquiring the identity of their discipline. They will have taken another step towards becoming biologists, art historians or archaeologists, for example.

An illustration of phylogeny, the evolution of genetically related groups of organisms, was selected to show how object handling can be used to support learning. Five groups of conference delegates

focused on the evolution of the mammalian skull. They studied the skulls of primates. The first task was to identify the objects. It was not too challenging to guess that all were skulls, but not so easy to guess that they came from primates. Delegates were then asked to brainstorm on three characteristics of the primate skull which distinguish it from a reptilian skull.



Fig. 3 - A mammalian skull: the four-horned antelope © UCL Grant Museum of Zoology

The experience of viewing, holding and closely examining the skulls engendered a sense of excitement in the lecture theatre. The groups were invited to report on the results of the brainstorming session. They did remarkably well in identifying the relevant features of the skulls. These included: the single jawbone, the two lumps on the bone where the spine enters the brain, and the mammal's differentiated teeth. All these features could be observed and inspected on the sample skulls, reinforcing learning visually, through touch, and through communication with

colleagues. Reptiles, in contrast, have seven-part jawbones, a single bump where the spine enters the brain, and only one type of tooth, essentially for stabbing.

Completing Kolb's experiential learning cycle

Phase 1 of Kolb's experiential learning cycle had been completed. Phase 2, reflection and observation, was a consideration of the learning process. It had involved listening, speaking, looking, and touching. The groups had interacted and been thoroughly drawn into the learning process by the requirement to study the objects and brainstorm. Phase 3, forming abstract concepts, was facilitated by the provision of an outline of the advantages of OBL as a form of active learning. Finally, in phase 4, proposals for testing OBL in new situations were made.

The following steps were suggested when planning OBL sessions. If learners are involved in this process, and can select an activity from a choice of options, they will feel highly motivated, which aids learning. First, a 'threshold concept' to be negotiated is selected. Objects which might help to support that learning are sought out. Learners are asked to speak or write about their current knowledge of the concept or topic. This is important, as misconceptions can be identified and cleared up.

Preparation for engagement with the object should be detailed. Students may need to read texts or study images so that they can benefit fully from the time they spend working with the object. The learning activities which are to be completed also need to be carefully designed. The aim will be to encourage close observation, discussion, and reflection through learning activities based around the object. Students could be required to write their own question sheets to complete or these could be supplied by the teacher. Sketches, not for the quality of the drawing, but to aid close attention to the artifact, may be made.

Follow-up activities are also useful. Virtual images of the artifact can be helpful, and additional reading, writing and oral work may be done to consolidate learning. Assessment tasks can be carried out using related or similar artifacts. Assessment has a strong influence on learning and traditional timed written examinations may lead to last-minute cramming. A flexible exploration of student understanding using museum objects can take place on several occasions during a course of study. Students can be invited to engage in a dialogue with an examiner based on an artifact. Attention to the learning outcomes which are being tested is essential. If a careful marking scheme is prepared, student performance can be evaluated relatively easily.

Conclusion

Artifacts offer learners in HE the opportunity to engage with exciting learning which goes beyond the study of the object itself, facilitating the understanding of challenging concepts. Teachers need to plan OBL and its assessment with care, but the time invested will be worthwhile. Once prepared, activities can be re-used with different groups of learners. Based on our experience at UCL, we believe that enriching learning will result.

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Contact

Dr Rosalind Duhs

Senior Teaching Fellow

Address: Centre for the Advancement of Learning and Teaching (CALT), University College London,
1-19 Torrington Place, London WC1E 7HB, UK

E-mail: r.duhs@ucl.ac.uk

www.ucl.ac.uk/calt

The role of object-based learning in transferable skills development

JENNY MARIE

Abstract

This paper considers how object-based learning (OBL) can be used to complement reflective skills development systems, which are commonplace in UK universities. It describes how some UCL students had difficulty understanding the concept of such a system and in choosing skills to develop. We therefore began developing a series of OBL activities, which could be used to help students understand how the system should be used and to identify their skill strengths and weaknesses.

Introduction

The development of transferable skills has become a major issue in United Kingdom (UK) higher education in the past decade.¹ Many UK universities support skills development through electronic skill systems, which allow students to reflect on their skills, plan their development and record evidence of their skill levels. This paper will suggest that object-based learning (OBL) can provide a complementary aid to such systems through a discussion of the key skills/OBL project based at University College London (UCL).

Background to the project

UCL has had a paper proforma, which prompts students to think about their skills development, since the late 1990s. However, it recently decided to create an electronic key skills system, with the aim of encouraging the practice to spread more widely across the university. It is intended that both transition mentors² and personal tutors³ will support the system. A paper version of the system was piloted in 2008/2009 in eight academic departments (archaeology, biological sciences, civil, environmental & geomatic engineering, Dutch, economics, English, mathematics and science & technology studies). During the pilot it became apparent that students found it hard to select skill areas to develop and that they did not necessarily understand the purpose of reflecting on their skills. These findings prompted the formation of the UCL key skills/OBL project, comprised of Helen Chatterjee (Director of Studies for Biological Sciences and Deputy Director, UCL Museums & Collections), Celine West (Head of Learning and Access, UCL Museums & Collections), Hayley Noakes (UCL Transitions Programme) and myself (UCL Centre for the Advancement of Learning and Teaching). Helen Chatterjee and Celine West advised on the OBL side of the project, Hayley Noakes on working with transition mentors and I advised on the key skills side. The project was funded by the UCL Centre for the Advancement of Learning and Teaching. Before looking at the project in more depth, I wish to first consider how skills are developed.

The development of skills

A skill is an ability to do something, such as play the piano or work productively in a group. Skill development occurs through the process of learning from experience, which is modeled by the Kolb learning cycle (and see DUHS 2010).

¹ As evidenced by the Dearing and Roberts reports (THE NATIONAL COMMITTEE OF INQUIRY INTO HIGHER EDUCATION 1997; ROBERTS 2002).

² UCL has a system whereby second and third year undergraduates are recruited and trained to give first year students help and advice during their first term (for further details see www.ucl.ac.uk/transition/student-mentoring, accessed March 30, 2009). These students are termed 'transition mentors' because it is intended that they aid the process of making the transition from school to university.

³ The system of personal tutoring is widespread in the UK. Personal tutors are responsible for the pastoral care of students and in many instances they hold an overview of the students' academic progress and thus also undertake some academic tutoring.

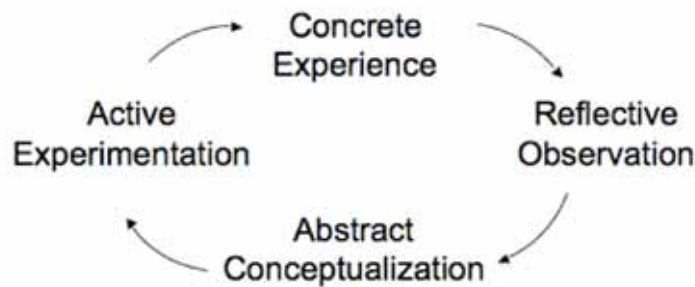


Fig. 1 - Kolb learning cycle (KOLB 1984, 42)

David Kolb argued that our senses provide concrete knowledge of an experience. If we reflect on that concrete knowledge we can transform it into a concept about what happened and why. To test the theory we must actively experiment, which in turn will create another concrete experience. To develop our skills, we must therefore do something and reflect on it to come up with an idea as to how we can do it better. We must then try this out and reflect on the results to see if our idea was correct and what else we can improve.

Transferable skills, such as listening, interpersonal communication and teamwork underlie most activities. Undergraduate students practice these skills everyday in both their normal academic work and extra-curricular activities. What they may not do is reflect on what these activities tell them about their skill levels and how they could develop them. UK universities have therefore focused on supporting the reflective part of the learning cycle.

The difficulty arises when students fail to see the link between this abstract reflection and the realities of everyday life. Feedback on UCL's pilot suggested that students found it hard to select skills to develop and they could not understand why they were being asked to reflect on their skills: they would much prefer to be offered workshops. Students did not recognize that the system was intended to support learning from what they already do rather than being a complete teaching tool in itself. A solution to this seemed to be modeling how the system should interact with everyday activities and demonstrating how reflection on these activities could reveal areas of weakness, which they may wish to consider developing further. We therefore set about creating loan boxes and activities for students to use in combination with the key skills system as an exemplar of how it could aid their development.

Project progress

So far the UCL OBL/key skills project has created two loan boxes and five activities that are intended to be relevant to any undergraduate student. The activities are:

1. *Mystery object handling*: groups of students try to work out what different objects are by handling them, discussing and asking questions about them.
2. *Describing and drawing objects*: students work in pairs. One describes the object to the other who cannot see it and the other tries to draw it from the description.
3. *Contentious issues*: groups of students debate an issue related to a set of objects. For example, "Museum objects should be kept locked away to preserve them for future generations, not taken out and handled in the name of a 'good experience'".
4. *Creating a questionnaire*: students work individually to create a questionnaire of approximately ten questions regarding a set of objects. They then ask each other to fill in the questionnaires, analyze the results and present these to the group.
5. *Writing and drawing a story*: students choose an object from the loan box and write a short children's story about it, illustrating it if they wish. They then share the stories.

We tested the activities with a focus group of six transition mentors, who we hope will run the tasks with their mentees. They all either commented that the objects were interesting or that they were a good range of objects from various disciplines. Of the three activities we trialed, there was a consensus that the drawing task was most enjoyable, then the mystery object handling task, with the writing and drawing a story task being the least enjoyable. They stated that they became frustrated with the story writing task because they wanted to discuss the objects.

Five of the mentors said it was a good way to develop transferable skills. The other one was concerned that students would only engage if they already wanted to develop their skills. Most thought it was important to develop their transferable skills but that it was important to make the relevance of the activities obvious, possibly by linking them to the group's discipline.

The mentors also emphasized the importance of keeping the exercise fun. They found the recording side less enjoyable and worried that this may not occur in a voluntary session. For the same reason they thought the session should not be labeled 'transferable skills' but equally they did not know what object-based learning was. They also told us the exercises helped them to understand what some of the skills were. However, if they were to run the sessions they would require training first.

Having analyzed the feedback from this focus group, we intend to refine the activities we have and to further test them with other groups. We also want to work with academic staff to develop discipline-specific loan boxes and activities, so that students can see the relevance of the activities.

Conclusion

OBL can offer a way into transferable skills development for students. They have many opportunities to practice their skills and so many UK universities, including UCL, have focused on supporting the reflective part of the skills development process. However, our piloting of a reflective skills system suggests that students do not find it easy to understand the purpose of such a system nor to identify which skill(s) to develop. OBL offers an enjoyable way to model how activities should be reflected upon and recorded in a skills system.

Acknowledgements

I would like to thank Celine West, Helen Chatterjee and Hayley Noakes for their hard work on the project. I would also like to thank CALT, for supporting this project with an academic development grant, and all the members of the key skills working group, key skills project board and personal tutoring project board, whose work made the piloting of a transferable skills system possible. Finally, my thanks go to Helen Chatterjee and Jack Ashby for organizing the OBL day at UCL, where this paper was first presented.

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Contact

Dr Jenny Marie

Senior Teaching Fellow

Address: Centre for the Advancement of Learning and Teaching, University College London, 1–19
Torrington Place, London, WC1E 7HB, United Kingdom

E-mail: j.marie@ucl.ac.uk

www.ucl.ac.uk/calt

Object handling in the archaeology classroom – Strategies for success

RACHAEL THYRZA SPARKS

Abstract

Direct encounters with archaeological materials are an effective way to teach the practical side of the discipline while developing transferable skills such as observation, deductive reasoning, critical analysis and group working. This paper draws on the authors own experiences to develop guidelines for object handling in the university classroom. Good preparation, informed implementation, consolidation of gains and integration of such sessions into the wider curriculum are key elements of an effective strategy.

Introduction

Material culture provides a tangible link between the past and the present. Handling objects can make that past more real, with the opportunity to filter the physical and unfamiliar through our own networks of association and experience. The immediate and personal nature of the encounter makes it memorable and can generate rewarding levels of enthusiasm amongst students and teachers alike. It is not surprising then that object-based learning (OBL) has been a core element of archaeology education for some time (e.g. BEAZLEY 1989), and indeed a recent QAA benchmark statement for archaeology defines OBL as fundamental to the way archaeology should be taught (DOONAN & BOYD 2008, 108). Yet despite this there is little formal instruction offered in showing tertiary staff *how* to teach with objects, and the majority of lecturers at my own institution seem to have developed their own pedagogic strategies through a matter of trial and error. While this has led to some excellent and innovative teaching practices, busy schedules mean that staff rarely have the time to share their methods with others, lessening the long-term impact of their work. This paper aims to redress this situation by sharing my own reflections on effective ways to teach archaeology through object handling. These are based on an evaluation of surveys and in-depth interviews with UCL staff on how they use objects in their teaching (KÖSTER 2005 and unpubl. reports by N. Merriman 2000 and K. Piquette 2008), along with observations of object handling sessions, discussions about teaching practice with my colleagues, and the field testing of different strategies.

Organizing a successful object handling session

Most students enjoy working with objects; however a poorly planned session can also leave students bored or confused. To avoid this, good preparation is essential. Object handling sessions are sometimes scheduled as optional 'extras' to a course, but this sends out the message that the class is not important. So the first step should be to ensure that the session is seen to be an integrated and relevant component to your course. Scheduling is equally critical: will the session be introducing new knowledge or techniques, or building upon them? A misplaced handling session can undermine all you hope to achieve.

The next step is to identify suitable material for your class. In archaeology, this is usually sourced in one of three ways: personal handling collections (drawn from fieldwork, research material, purchased replicas and modern items), objects borrowed from colleagues, and departmental or museum collections. Personal handling collections give you more control on how you access material, but museum collections generally provide a better quality and range to choose from. For those who decide to use museum collections, it is important to develop good relations with curatorial staff and to negotiate any potential conflicts in your respective interests (HOOPER-GREENHILL 1985). Table 1

suggests practical ways in which such conflicts can be resolved. The final stage is to assemble suitable support equipment. This might include items to enable a safe handling environment, such as gloves, surface padding for tables, and trays to move objects around the room, as well as equipment that help students to interact more closely with objects such as lamps, magnifying lenses or calipers. Laminated instruction sheets, reference material to help put the artifacts in context, activity worksheets and handouts can also be useful aids.

Curatorial wants	Teaching wants	Solutions
Controlled access that meets national standards with regard to storage security	Open access to speed up preparation and setup time	Teachers are given good access to material prior to class. Curatorial staff deliver objects to class on the day, or teachers are given secure cupboards for their objects within teaching spaces.
Record object movement for collections management	No paperwork – just get objects and go	Collections staff assist with paperwork or do it for teachers. Teachers give collections staff adequate warning of coming classes.
Limit handling to prevent damage	Artifacts for intensive handling	Create teaching collections of duplicate or replica objects. Rotate objects in use so handling contact is reduced for individual items. Coat metal objects with barrier wax for safer handling; provide Perspex boxes for fragile objects.
Limit risk to high value or important objects	Quality objects that are interesting, well provenanced and well researched	Curators work closely with teachers to find suitable material and to research chosen items. Unique objects are made available only through associated displays. Other material safeguarded by controlling object delivery, teaching environment, and setting handling conditions.

Table 1: Perceived teaching versus curatorial demands in object-based learning

Teaching strategies

When it comes to running an actual object handling session, the structure of the session will have an impact on the type of interaction that takes place within it. Constraining factors include the size of the class, room layout, class length and how many facilitators are available. Approaches can range from 'demonstration' mode, where one person leads the entire class, to group activities and independent work.

Object demonstrations are one of the most common forms of teaching with objects, perhaps because it is the closest in format to a traditional lecture (fig. 1). In the demonstration model, learning is largely teacher-driven. A facilitator stands in front of a group and 'explains' each object to them. It may be a didactic process, with the teacher pointing out features then passing objects around so the students can observe them directly. It can also be more query-driven, in which the teacher uses prompts or questions to help students discover features for themselves. This type of teaching requires a single table that is large enough for all the students to stand around, and is generally suitable for smaller classes sizes of up to 12–15 students. It also tends to work best in a short session format of no more than an hour.



Fig. 1 - Working in demonstration mode: ceramic pot marks are used to generate discussion on symbols and early writing systems.

The advantages of this approach are that the teacher retains control of what ideas are being explored, ensuring that the appropriate material and knowledge is covered during the session. This is particularly appealing to those who have concerns in delivering a set amount of core knowledge. The disadvantages are that students do tend to look to the facilitator for information, rather than trying to discover it for themselves (CURTIS 1997, 32), while

not all students may have an equal opportunity to participate. One common problem in the way this type of session is implemented is that there is often a time lag between an object being introduced to the class and students examining it for themselves. One solution is to bring several examples of an object type to the table, so that they circulate more rapidly. Another is to vary the way the objects are handed out, so that each student has the chance to be the first to see and discuss at least one item.

An alternative approach is the 'activity workstation', where students are assembled into small groups around objects and discussion of the material is created within each group. There may be a set task provided, but it should be up to the students to explore the material themselves and draw their own conclusions. Teachers can move between groups to provide guidance, and use general discussion time or supplementary fact sheets to provide the students with further information at the end of the exercise. It requires a flexible room arrangement with groups of smaller tables and material that can be divided up into several activities. Groups can be static, remaining at a workstation for the whole session, or mobile, rotating between activities. How large a class can be accommodated depends on the teaching space, but generally it suits around 10 to 30 students. Within this groups should be kept

small; a minimum of two is required for interaction, and up to five people works well. The more you add to this, the greater the opportunity for non-participation (LAWSON 2000, 642). If the activities are well designed, this format can also support longer sessions of up to three hours.

The advantage of this method is that it is a student-driven approach with greater levels of interactivity than demonstration classes. As discussion takes place primarily with peers, students feel less constrained in what they say, while the teacher is left free to observe the class and take note of how individual students are responding to the activity. The disadvantage of this model is that it is more time-consuming than a demonstration class, and strict time keeping is essential. Not all groups may work at the same pace, and there is the risk that some may get distracted and start to socialize rather than work. If this happens, you need to think whether the activity is too long, too easy, or if the students simply lack the conceptual or practical skills to carry it out, which may affect how much they are able to learn from the experience (GOODHEW 1980, 17).

Another tactic is to give students access to objects for individual or group research projects. This mode of OBL has certain requirements. The teacher must schedule one or more classes in which the projects and methodology can be introduced, and then either a series of follow up sessions in which students are given research time, or flexible access to material outside class hours. It may require greater contact time and hence be more difficult to organize. However it can also offer the greatest rewards in terms of student understanding as there is increased cumulative contact between student and artifact, while students learn crucial research skills.

A holistic strategy for object-based teaching

These models are only some of the ways in which object handling may be presented. Additional class types could include object practicals where individual skills and techniques are explored (experimental archaeology, drawing classes, photography, statistics, conservation), hypothetical exercises where students employ role-play to engage with material, one-off museum or site visits, and longer fieldwork or museum placements. While each method can work independently, in practice a combination of approaches is often key to forming an effective OBL strategy over a wider course or degree. Students can be introduced to object working through using the demonstration mode, testing or honing their ability to observe and make deductions, before moving on to group activities. Practical handling sessions can be combined with research that lets students apply the skills they have begun to develop. Lessons learnt can be reinforced in formal lectures, where visual aids can reflect back upon material the students have handled themselves.

The final step is to embed any OBL sessions into a course by adding some element of assessment to activities, so students can see that their participation will have a tangible outcome. This could be done in a variety of ways, such as by designing essay topics or exam questions around material they have engaged with, or through the use of reflexive logs, activity portfolios and object vivas. And on a wider scale, OBL should be a fully functioning part of a broader curriculum (HOOPER-GREENHILL 1991, 114). At the Institute of Archaeology, this is currently achieved by building in critical OBL elements into core parts of its degrees, such as a mandatory 70 days of fieldwork and involvement in its experimental archaeology field course, as well as integrating various forms of OBL into the many optional modules on offer, with assessment type and design linked to student progression.

Conclusions

A successful OBL session is not an accident. It comes about because the facilitator has:

1. Thought carefully about what the activity is supposed to achieve
2. Considered the logistics involved (CAIN 2005, 3–4).

3. Developed a structure suited to the group and environment
4. Successfully communicated the purpose of the class and methods to be used
5. Is alert to the needs of the students on the day
6. Is mentally prepared to deal with any unexpected factors that may arise
7. Rewards the students for participation so they feel the session has an outcome
8. Embeds the session into the broader course and curriculum

The key to success lies in adequate preparation, informed implementation and subsequent consolidation of the gains made by students. While all of this requires considerable planning and investment of time, the rewards can be considerable. As students become more engaged with their own learning the quality of their work should improve, while classes should become easier to run and more enjoyable to teach.

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Contact

Dr Rachael Thyrza Sparks

Keeper of Collections/Lecturer

Address: Institute of Archaeology, University College London, 31–34 Gordon Square, London, WC1H 0PY, United Kingdom

E-mail: r.sparks@ucl.ac.uk

www.ucl.ac.uk/archaeology/staff/profiles/sparks.htm

www.ucl.ac.uk/museums/archaeology/index.html

Practical concerns when implementing object-based teaching in higher education

JOE CAIN

Abstract

The first rule of business is “know your customer”. This essay focuses on the user’s perspective: what do tutors need to make OBL an attractive proposition? It dissects three customer needs: the need for engagement, logistical concerns, and pedagogical dimensions. Several suggestions are offered regarding each type of need. The overall goal is to encourage the structuring of OBL promotions and provision in ways that integrate easily into the working life of tutors. This is the key to successful programme development.

Introduction

What do museum workers need to do to make object-based learning (OBL) an attractive proposition to university tutors? In principle, OBL offers superb tools for learning (DURBIN, MORRIS & WILKINSON 1990; WILEY 2000; PARIS 2002; LANE & WALLACE 2007). However, teaching through objects is hard work. This essay is written by a tutor with two decades experience using OBL in higher education. It is intended as advice to OBL providers in the ongoing dialogue between producer and consumer (CAIN 2005). The first rule of business is “know your customer”. Rather than create programmes in isolation or for idealized sessions, OBL programmes should be organized around this maxim.

Engagement not deficit

If you want to promote OBL don’t simply broadcast that message. When someone tells you, “we just need to get our message out more”, they’re using the deficit model of communication. This assumes the audience has a deficit of knowledge, which you try to fix that providing some.

The deficit model doesn’t work. Simply talking more – or louder – has little affect on most users’ knowledge, understanding, or level of engagement. To draw tutors into OBL, create a dialogue. Ask about our goals and needs. Ask about constraints on day-to-day delivery. Work with us to overcome barriers preventing our participation. If you want OBL to be successful, talk with your customers.

Barriers to uptake

OBL is a tough sell. Most tutors have strong incentives to not change their curriculum and to avoid spending time developing diversions that seem mere curiosities. Demands on our time are crushing, and our reward systems are quite specific. Time spent on curriculum re-design is time away from things that are better rewarded. In this section, I identify some key barriers impeding use of OBL at universities.

Competition

Competition is stiff in today’s audio-visually complex learning environments. When I design an OBL exercise, my choices include museum material, site visits, demonstrations, etc. However, I’ve other options, too. To be honest, museum objects seem luxurious choices. Before these, I consider easier options: mental pictures I can create through words, material I can provide myself, and images I can project on a screen or in a handout.

These are objects, too. One reason for their appeal is availability. Practically, I’m often planning coursework late at night; the night before. Digital images are convenient ports of call. This is more true

now, with most classrooms capable of good projection. These options also allow me to work around other demands on my time and to change things quickly. Can your OBL programme do that?

For context, I organize 80–100 lectures each year. I don't have time to create ideal situations, and I can't afford to spend large amounts of time preparing any single event. On a day-to-day practical level, 'simplicity, availability and accommodation' critically influence my decisions about OBL. Often, "good enough" simply must be good enough. That's a 'sufficiency' criterion. If you want to prevent me from compromising with inferior choices, convince me your collaboration is not just better, but 'phenomenally' better.

In addition, you'd be smart to build a system for access that accommodates impulse, topicality, and – frankly – me coming in with a line like "I've just had a great idea ...". You know which objects in your collection have relevance to current events. Help me make those connections.

Logistics

Logistical concerns are a second barrier. For OBL to be a good use of precious class time, it must work smoothly. As an example, imagine we organize a simple demo in a typical lecture theatre to demonstrate some old microscopes. Imagine, I want students literally to see what Enlightenment microscopists saw when using equipment from that period.

While fantastic in theory, logistical concerns make me hesitate. Table 1 lists some of the concerns I'll want sorted before agreeing to this OBL project. Visiting museums and other display spaces adds more concerns, listed in table 2. Of course, experienced museum workers will be familiar with many of these. Still, regardless how experienced 'you' are, your customers likely are novices. It's 'their' sense of the problems that's relevant in this case. The more you can support the logistical side of OBL, the more you'll lessen these anxieties and the more effective will be your uptake.

In the microscope example, I accept first-hand observation through real lenses as ideal. But I'll settle for a few photographs, maybe also a video. These won't be perfect, but they'll be good enough under the constraints. Unless we can create something significantly better with OBL, I won't be tempted.

A different kind of learning

OBL isn't just about objects; it's about teaching, too. It's inextricably linked to criticisms of chalk-and-talk lecture styles and to the promotion of active, open-ended, student-centered learning. These connections cause a third barrier to OBL uptake.

Many university tutors have a poor foundation in pedagogy. Most won't have a clue what to do if the simple passive download model of lecturing was disallowed. Promotion of OBL asks for a radical change in teaching style. Anecdotally, I know a tutor who thinks students can't learn while they're talking. Another hates being interrupted for questions. Another sets as their goal the delivery of a certain amount of factual information. If they don't meet their quota, they think students won't have enough to give back on the exam. OBL asks for pedagogical skills these tutors simply don't have.

Don't try to sell cars to people who don't know how to drive. OBL arrives in a tutor's life as a pair of ideas: something about objects and something about learning. If you want increase uptake, see OBL as a problem of two interlinking parts.

Points for exploitation

Towards some solutions, consider the following few suggestions:

On competition, remember: a picture is worth a thousand words. Supplying images can be as useful for OBL as offering objects, demonstrations, or site visits. They're not ideal; just good enough. Don't

think this need be a one-way relationship. I can use images from your collection to promote your collection. And ask me to register my use; I'm happy to tell managers and patrons how much this helps.

On logistics, be flexible with the packages you offer. Site visits can be prohibitively demanding. A 5-minute topical show-and-tell involves a different level of commitment compared with a 50-minute hands-on activity or a half-day site visit. Give me some options.

Also, help me use time outside my already overcrowded two lecture hours each week. We might choose objects and displays I can recommend for informal viewing. Direct me to your events, and tell me what you're planning. I can tweak these to fit my learning objectives. These spare me logistical problems. They also reward curiosity, initiative, and creativity by the students. I use your competition this way: films and walking tours, radio and television, newspapers and websites. Keep me in your advertising loops.

Two ideas relate to pedagogical barriers. First, appeal to my frustration with the work students normally produce in their assignments. Remind me that regurgitation is a low-level cognitive skill and that I don't have to encourage it. Show me examples of OBL so I can see its possible to have more than just a few students do something interesting, independent, and beyond rote repetition. After reading two dozen essays that look a lot like each other and are suspiciously close to an entry in some online source, believe me, I'm ready to listen. Some of the more tempting benefits of OBL, from the customer's perspective, are listed in table 3.

Second, think about your promotional strategies. Don't simply tell me what you're able to provide. Also, embed your OBL programme into processes tutors use for building curriculum and improving pedagogical skills. Place your OBL programme at the centre of staff development courses, e.g., training courses in group work and student-centered learning. Or, offer training courses yourself. One persistent criticism of much staff development is the overuse of outside contractors. However talented, these people lack local knowledge. You don't. That gives you a crucial advantage. Train your users in the skills they'll need when using OBL, and do it with materials you make available. Teach me to drive in the car you want me to buy.

Conclusion

In sum, four points are key. First, abandon the deficit model for communicating information about OBL. It doesn't work. Second, focus on the customer's perspective. Understand barriers as we tutors conceive them. Third, remember some barriers have nothing to do with the objects themselves. There's stiff competition, and logistical concerns can overwhelm. Plus, OBL asks a lot of tutors. If you don't support the whole package, you'll be offering only half a solution.

It's easy to cherry-pick in OBL, using extraordinary material carefully prepared, with highly motivated and specially supported tutors, then delivered to selected populations of overly eager students. It's quite another matter to roll out changes across a whole teaching programme or across a whole institution within the practical constraints of normal work. I know firsthand how OBL turns people on to learning, especially when all else fails. I also know it's hard, skilled work. We tutors are grateful for the work museum people do to promote it and to create more. With careful attention to our practical needs, OBL provision can be made all the more effective and widespread.

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Contact

Dr Joe Cain

Senior Lecturer in History and Philosophy of Biology

Address: Department of Science and Technology Studies, University College London, Gower Street, London WC1E 6BT, United Kingdom

E-mail: J.Cain(at)ucl.ac.uk

www.ucl.ac.uk/sts/cain

Table 1. Some logistical concerns raised by the tutor in a case study of OBL in a traditional lecture theatre

Setting – Can I get this delivered to the lecture theatre?

Timing – I only have 50 minutes in the room. Can I ensure the activity is delivered, setup, explained, done, and packed in time? Plus, we need time to process, interpret, discuss, and contextualize.

Access – All students need time with the objects, plus time to move around. Most teaching rooms are designed for sitting not circulating.

People management – What will the other students be doing when not using the objects?

intellectual groundwork – What background knowledge do students need? What needs to happen for them to take away the maximum impression? When am I going to do this preparation with them?

Settling in – Novices experience objects differently than experts do. How much orientation time is required? How do I isolate their attention onto what I want them to focus on, rather than distractions? Do I build in time for play and open-ended discovery?

Trust – Class time is precious. Time spent in OBL must 'in fact' move us towards my course objectives. It also must 'be seen to move us' forward. I need to be confident students will feel the work is relevant. I rely on them trusting me on this point, and I won't risk breaking that trust.

Recording – What do students preserve from the experience? How will they recall it later, or reflect on it, or build on it? What note-taking needs to be done?

Shut off – When I'm done with the objects, I'll want to move on. I need effective transitions. If I can't put an object away immediately, or move attention off it, I might as well not move on.

Follow-up and back-up – What happens when students want more – e.g., for revision or for those who were absent? I need effective substitutes.

Co-ordination with other courses – Have students done this before? Will it be useful elsewhere in their degree? Can I double-up and involve other courses? Tutor's often don't share information; how much time is it going to take to negotiate this with colleagues?

Table 2. Some logistical concerns raised by the tutor in a case study of OBL when learning is moved away from the assigned rooms, e.g., to a museum (access and risk assessment are assumed)

Alternate location – I need to sort instructions and work to ensure students receive these repeatedly, especially novices. Will weather be a factor? ~Any transport costs? If this doesn't take a whole period, what am I going to do with the remainder of my time?

Timing – I need to ensure students can arrive, work, and leave in the time slot I am assigned, anticipating where they are coming from and going to with time to spare. I don't take kindly to other tutors running into my time; neither do my colleagues.

Physical environment: Where are the toilets, the seating areas, the places to put coats and bags? What are the security and meeting point needs?

Co-ordination on the day – If other staff are involved, do they know what I'm trying to accomplish? Are we working to the same plan? Do I know what I need for preparation? Have I given myself time to prepare others and for post-match analysis?

Table 3. Reasons a tutor might be persuaded to introduce OBL projects both in course sessions and to replace coursework based on rote assembly of information

1. Students increase self-awareness and engagement during breaks in their minute-to-minute and course-to-course routine.
2. Students encouraged to be curious are easier to teach, do more work, ask more interesting questions, and – frankly – write more thought-filled essay.
3. Memory is complicated. Some people process texts and facts well; others work better through images, spatial thinking, sensory inputs, and so on. Each dimension has value in learning.
4. Intelligence is complicated, too, including layers related to linguistic, logical-mathematical, spatial, musical, kinesthetic, inter-personal, and intra-personal capacities.
5. OBL can exploit time outside the schedule for informal learning, thereby complementing or supplementing formal learning in the course.
6. Students prefer multimedia and multisensory experiences when learning (BALLANTYNE & KNOWLES 2007).
7. Indirect benefits can accrue. For instance, in a study of hospital patients, those with a view of a natural outside scene from their beds recovered faster than those with a view of brick walls (ULRICH 1984).

Heritage in hospitals: Using museum objects to teach communications skills

GUY NOBLE

Abstract

Museum objects can be used to inspire a wide variety of teaching and learning. This paper discusses how museum objects can be used to teach communications skills to medical students as part of a project investigating the benefits of taking museum objects to patients at University College London Hospitals.

Introduction

A pilot project investigating the benefits of taking museum objects to patients at University College London Hospitals (UCLH) revealed the huge potential that museum objects can play not only in the improved well-being of patients but also in the training of medical students and specifically how museum objects can be used to teach communication skills.

This article will briefly discuss UCLH National Health Service Foundation Trust's Arts Project: UCLH Arts and its partnership role in the instigation of the Heritage in Hospital research project. It will focus on medical students' expectations of the project, the benefits to them and ultimately demonstrate how this project developed student communication skills.

University College London Hospitals Arts

UCLH Arts provides a welcoming, uplifting environment for all patients, visitors and staff at UCLH through the use of a varied and stimulating arts programme. It runs an exhibition programme within UCLH, commissions site specific art work, hosts music events, workshops and artist residencies. It also commissions research into the benefits of arts and health and runs events to assist with staff professional development. In so doing it aims to improve patient well being, boost staff morale and widen access to the arts.

Background

UCLH Arts believes that the provision of the arts within a hospital environment is integral to providing a high quality, modern patient-centered NHS. This belief is underpinned by research¹ and UCLH Arts has instigated a number of research and evaluation projects such as the research discussed here (CHATTERJEE & NOBLE 2008). It demonstrated a benefit to patient well-being but it also highlighted the role that museum collections and the arts can play in the education of medical students.

Past studies have shown that there are benefits in using the arts in the education and training of medical practitioners. The Clod Ensemble's, Performing Medicine project is perhaps the best known project of this type delivering workshops in theatre and movement techniques "to improve presentation, observation and communication skills, focusing on the way participants move, speak, see, interpret and analyse".² The Performing Medicine project also run events using visual art that "interrogate cultural/ethical issues relevant to healthcare".³ Research published in the Journal for Internal Medicine found that formal art observation training improved medical students' visual diagnostic skills (NAGHSHINEH ET AL. 2008). Other research has shown that the arts can improve morale and job satisfaction and consequently job retention (STARICOFF 2006). Despite this evidence,

¹ There is a broad evidence base for arts in health but it is worth looking at, STARICOFF 2006.

² www.performingmedicine.com (accessed December 1, 2010).

³ www.performingmedicine.com (accessed December 1, 2010).

the case for the use of museum objects in medical student's development of observation and communication skills is still in its infancy. The pilot project discussed here reveals that museum objects can play an important part in the professional development of medical students.

Pilot project description

In 2006 five year 2 phase 1 medical students from UCL opted to undertake research into the role of heritage in hospitals as part of their student – selected component (SSC).

The project was designed specifically to fulfil SSC requirements⁴ (TOMORROW'S DOCTORS 2009). It had a series of overarching aims including:

- To provide medical students with communication skills, methods of assessing wellbeing and research techniques;
- To undertake an innovative project to demonstrate the unique, interdisciplinary, role museum collections can play in university teaching and research;
- To evaluate the potential of museum object handling as an enrichment activity in hospitals;
- To widen access to UCL Museums & Collections to a new audience;
- To widen the understanding of the role that the Arts and environment can play in patient care.

Student training covered museum object handling and museum education. In addition they were given information about UCL Museums & Collections (UCL Museums & Collections 2006), the history of UCL and object-specific information about the objects in their loan boxes and were supplied with a reading list which included literature from the arts in health sector. With training complete the students were inducted into UCH's volunteer programme which included training in infection control, patient confidentiality and ward logistics. The project ran for one afternoon a week for 12 weeks.

The sessions

Each student was supplied with a 'loan box' which contained a range of objects from UCL Museums and collections. Students delivered one to one object handling sessions at patients' bedsides using the loan boxes. They assessed patients using quantitative quality of life questionnaires. In addition patients' were asked to complete a mood adjective checklist and sessions were audio-recorded. Once the questionnaires were completed the students asked each patient to choose and explore an object and then a series of questions were posed about the objects to the patients. At the end of the object handling session the quantitative quality of life questionnaires and mood checklist were again completed by patients, the audio recorder was switched off and both parties either washed their hands or used alcohol gel.⁵

Formative assessment with students

As part of the introduction to the SSC the students were given a formative assessment to explore their existing knowledge of arts in health, their feelings towards enrichment and art / cultural intervention in healthcare and their reason for selecting the SSC. Their reasons for choosing the SSC were revealing:

- To increase communication skills with patients;
- To better understand hospital enrichment activities and their benefits;
- To conduct interdisciplinary research and gain new skills;
- To learn more about museums and to work with colleagues across UCL and UCLH.

⁴ See TOMORROW'S DOCTORS 2009.

⁵ For further information on the sessions see NOBLE & CHATTERJEE (2008) and CHATTERJEE & NOBLE (2009).

Summative assessment

Student communication skills turned out to be an important factor which impacted both the length of the sessions and the students' effectiveness in engaging patients in the project. The assessment revealed that the students felt hindered by their lack of general communication skills; evident when we listened to the audio recordings which were often stilted and sometimes not overly enthusiastic on the part of the students. During training we impressed upon the students the need to employ a sense of excitement and wonder whilst trying to engage patients, but the students' general lack of experience and perhaps confidence in talking openly with older people did seem to impact on their delivery of sessions. One student in particular highlighted concerns over "not knowing how to talk to older people, especially when they are very ill". The pressures of an NHS centered on targets and reduced waiting times means that clinicians deal with patients quickly and sometimes this can maybe at the expense of the patient's dignity. Poor communication skills would only serve to reinforce this.

Conclusions

The questions used in the delivery of the sessions were not the usual history taking that students might have previously experienced. The sessions, centered on the objects, and allowed students to have a different kind of conversation with patients which opened up the possibility for students to learn more about the individual patient. The sessions proved to be a great leveler; challenging the medical student's perceived role of expert and doctor, and testing their ability to communicate effectively with a person as opposed to just focusing on an illness.

Despite the students' inexperience in the delivery of the sessions they all felt that the module had enhanced their patient communication skills and importantly given them first hand experience of everyday ward life in their pre-clinical years. In addition the module allowed them the space to think creatively about patient care, and how they might be perceived by patients. The conversations that students had through the objects with the patients brought home to them the importance of considering the whole person when treating a patient. It emphasized the need for regular non-clinical communication training for medical students taking them out of their comfort zone and challenging them to work with patients in new ways.

Museum objects teach new communications skills to the medical students by:

- Revealing new information about the patients and consequently the role that they can play in patient / doctor interaction;
- Providing a context for a different kind of conversation, which takes the time to respect the patient as an individual and therefore challenged them to look beyond the illness.

The use of museum objects in medical education has huge potential; as seen in approaches used in Clod Ensemble's Performing Medicine project, objects can be used to encourage analytical, observational skills and also explore socio-cultural issues relevant to health care. Museum practice has a potential to offer transferable skills to medical students particularly when comparing cataloguing and recording the provenance, condition of objects with approaches to patient history taking. This project demonstrated that challenging students' perceptions of what patient care can be, leads to improvements in student communication skills and consequently an improved patient experience.

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Contact

Guy Noble

Arts Curator, UCLH Arts

Address: University College London Hospitals NHS Foundation Trust, ICT Directorate, 3rd Floor, Maple House, 149 Tottenham Court Road, London, W1T 7BN, United Kingdom

E-mail: guy.noble@uclh.nhs.uk

Sequel – An artistic collaboration between the Slade School of Fine Art and UCL Museums & Collections

SIMON GOULD

Abstract

Students of the UCL Slade School of Fine Art made new work in response to old works in the UCL Art Collections for on-line and physical exhibition in the first half of 2009. This was the first collaboration of this sort and has already led to further, similar projects. The project provided a fantastic opportunity for students to get hands-on with a remarkable collection of old masters and modern treasures as well as being a rare and valuable experience for their futures as professional artists. At very little expense this collaboration had a large impact providing improved awareness of the Art Collections and UCL Museums and Collections more widely.

Introduction

Sequel was a collaborative project between the Slade School of Fine Art and UCL Museums & Collections, with a particular focus on the objects of the UCL Art Collections.¹

Sequel began with an invitation to all current students at the Slade to revisit the past masters within the UCL Art Collections and to create new work in response; to continue to develop their own practices using contemporary media and contemporary modes of thinking while taking time to consider and appreciate what has gone before.

Despite being on adjacent sides of the same university quadrangle and despite deeply interconnected histories, The Slade School of Fine Art and the UCL Art Collections have in more recent years grown apart. This unprecedented project sought to rejuvenate this seemingly obvious partnership in the spirit of collaboration that has always been at the centre of so much of UCL's teaching and research.

UCL Museums & Collections are committed to strengthening their on-line presence and are always looking for new ways to reach audiences, especially with limited facilities for temporary exhibitions. As such, *Sequel* was conceived to produce artworks for on-line exhibition, created either as digital works in their own right or as works to be documented digitally. The exhibition of these works continues to exist at www.ucl.ac.uk/museums/sequel.

In March 2009 *Sequel* was launched with a one-night only physical installation of all works, new and old, in the Strang Print Room, where much of the UCL Art Collections are housed.

A brief history of the UCL Art Collections and the Slade School of Fine Art

The UCL Art Collections contain over 10,000 objects including paintings, drawings, prints and sculptures dating from 1490 to the present day. Works on paper are housed in the Strang Print Room, and paintings and sculptures are displayed in public rooms around UCL as well as in storage on and off site. Only a tiny fraction of these works are exhibited at any one time. The collection was founded in 1847 with a gift of the sculpture models and drawings of the neoclassical artist John Flaxman. For a long time, the objects in the collections were a central part of the Slade's teaching programme, an invaluable resource on its doorstep.

¹ *Sequel* was organized and curated by: Andrea Fredericksen, Simon Gould, Wynn Abbott, Susan Collins, Brigid Lowe, Jon Thomson and Dryden Goodwin.

The participating artists were: Emma Connor, Patricia Delgado, Andrea Greenwood, Erin Gutierrez, Hyo Myoung Kim, Janne Malmros, Junko Otake, Stephanie O'Connor, Kate Keara Pelen, Ryan Riddington, Alex Springer, Patricia Townsend, Amanda Wasielewski, Jayne Wilton.

The world renowned Slade School of Fine Art was founded in 1871 and was the result of a bequest from Felix Slade who envisaged a school where fine art would be studied within a liberal arts university. It is this guiding principal which makes for such a fascinating context in which to create art and which strongly supports projects such as *Sequel*.

What actually happened

Responding to an open invitation to explore the UCL Art Collections, more than 30 students received an introduction to the history, contents and locations of the collections from curator Dr Andrea Fredericksen. Save for a handful, none of these students had visited the collections before, despite being frequent exhibition-goers. The students ranged from first year undergraduates to MA and MFA students and incorporated the Slade's painting, sculpture and media specialisms.

The students then had a month in which to delve deep into the collections in their own time and to come up with a proposal for a new artwork based on something they found during this period. This process included one-to-one discussions with Dr Fredericksen that the students had to arrange for themselves, as well as discussion with their tutors. Their proposals were then reviewed by all the UCL Museums & Collections staff and Slade staff working on the project.² Those students who made successful proposals were then given a further month to create new work. As well as making the work this entailed further discussion with relevant staff about how best to produce and present their work for the project website.

How did the students as well as the Art Collections benefit?

Studying art is extremely different to most other subjects. Students decide what work they produce and when. Assessment is mostly based on presentation and discussion of a portfolio at the end of the year. Teaching is often more guidance and suggestion in contrast to more didactic approaches. Students are expected to seek out opportunities for themselves in order to further their burgeoning practices. This project was therefore immediately one such exciting and unusual opportunity delivered to their door. It was very encouraging then that so many students took up the challenge.

Sequel offered the students access to a professional archive and collection and a taste of the procedures that go along with this type of interaction. Knowing how to make an appointment with a curator; understanding how to write a proposal differently from an essay; learning how to navigate a largely hidden collection; researching and making work outside of the studio – for many these were new and valuable experiences which will benefit them in the years to come.

Perhaps more fundamental than all of these, *Sequel* allowed students hands on access to thousands of remarkable and historically important objects and created a scenario in which they felt this was relevant and inspiring to them.

The ongoing website and the launch event also gave all participants exhibiting experience for its own sake and for their CVs.

Sequel was also a fantastic opportunity for the UCL Art Collections to reconnect with the Slade and to provide an object-based teaching facility in an informal way which could still count for the students' formal assessment. The packed opening night brought a largely Slade audience to the Strang Print Room, including staff and students, many of whom were not regular visitors. The ongoing benefits of these new networks to the Art Collections are significant, as detailed further below.

² Project staff were: Andrea Fredericksen, Simon Gould, Wynn Abbott, Susan Collins, Jon Thomson, Brigid Lowe and Dryden Goodwin.

More generally UCL Museums & Collections benefited through all the extra views to its web pages through the *Sequel* microsite.

Then what happened?

Since the launch of *Sequel* several of the students have devised new projects to continue working with the Art Collections while others have begun to work with the Grant Museum of Zoology and with one off UCL projects like *Object Retrieval*.³ Despite these opportunities always existing for Slade students, it is projects like *Sequel* that provide a real stimulus to action.

Sequel was conceived in many ways as a pilot to see how this kind of collaborative object based work could happen. Its success and the relative ease of producing the project have meant that this is now planned as an annual event.

Sequel is also a very flexible model in which both the Art Collections and the Slade can be variables. For example the UCL geography department is now working with the Art Collections, with students also producing work in response to the paintings, prints, drawings and sculptures within. This came about as a direct result of the geography department having heard about *Sequel*. Such is the diversity of the contents of the Art Collections and this way of working that it is easy to imagine this happening very effectively with students from a whole host of departments, tailoring the projects to their own intellectual curiosities.

Early discussions with the Slade about working with other collections at UCL have similarly been met with enthusiasm.

These partnerships are not difficult to arrange but as is so often the case in large institutions, they do not often happen. It is often simply a case of people not having the time to take a sideways glance at what other departments have to offer. *Sequel* may be a simple idea but it could so easily have not happened, which would have been a great shame for those who took part and experienced it.

One final thought

For all the positive effects *Sequel* has had on the staff and students involved, as well as for the collections themselves, it cost virtually nothing. The only real financial cost was to buy the wine for the opening. UCL is hugely fortunate to have these sorts of object-based resources to hand and *Sequel* has been a great reminder of the possibilities of what can be done with these objects when put at the heart of teaching.

Acknowledgements

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Contact

Simon Gould

Contemporary Projects Curator

Address: 225 Wilkins Building, University College London, Gower Place, London WC1E 6BT, United Kingdom

E-mail: simon.gould@ucl.ac.uk

www.ucl.ac.uk/museums

³ See www.objectretrieval.com (accessed December 22, 2010).

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Editors

Sally MacDonald
University College London Museums and Collections
UCL, Gower Street
London WC1E 6BT
United Kingdom

Nathalie Nyst
Réseau des Musées de l'ULB
Université Libre de Bruxelles - CP 175
Avenue F.D. Roosevelt, 50
1050 Brussels
Belgium

Cornelia Weber
Humboldt University of Berlin
Hermann von Helmholtz-Zentrum für Kulturtechnik
Unter den Linden 6
10099 Berlin
Germany

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