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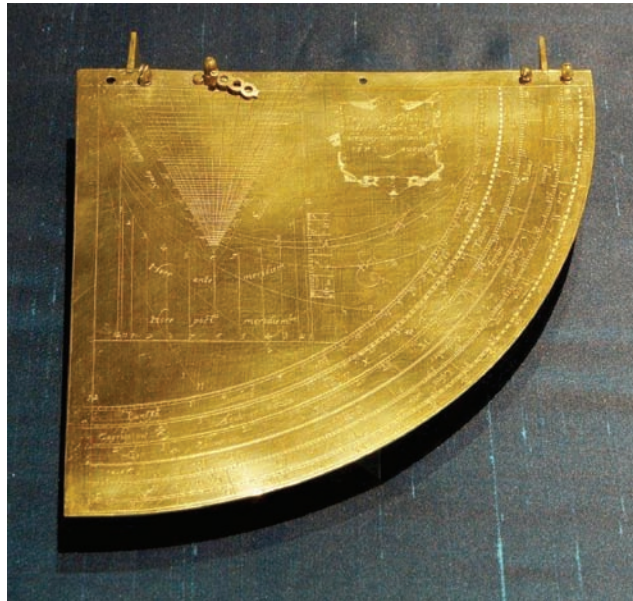
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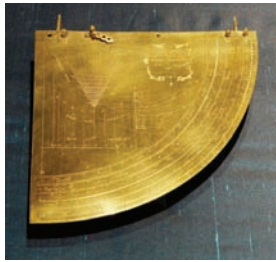
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University collections and university history and identity

**Proceedings of the 11th Conference of the
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Quadrant
Ieremias Arscenius, Leuven (Belgium)
1573, 17 cm
University of Lisbon, MCUL1162

Selecting a single object from a collection can be difficult and sometimes quite impossible. The collections of the Museum of Science hold more than 12,000 scientific instruments, of which up to 90% were used for teaching and research in physics, mathematics, chemistry and astronomy at the University of Lisbon for the past 200 years. I could, therefore, have chosen the typical 'university' scientific instrument – either unattractive and cannibalised after decades of intense use or perhaps a beautiful brass antique. Most likely, I would have chosen one of the former type.

However, to illustrate the cover of this issue of *UMACJ*, I have selected a brass antique that is not from the University of Lisbon – it is a long-term loan from a secondary school in Lisbon. It is the oldest in the museum collection and one of the oldest scientific instruments in Portugal. It is a quadrant (an astrolabic quadrant to be more precise) and it also has a Regiomontanus sundial. It was used to measure time through observation of the sun and stars. It was made in Leuven in 1573, thus predating Pope Gregory's calendar reform, at a time when Flandres was Spanish territory. Belgium would not exist before more than 250 years. Its maker is Ieremias Arscenius and this quadrant is the only known instrument signed by this remarkable craftsman. At the time, Leuven was a vibrant centre for the production and trade of mathematical instruments, maps and globes, with several major craftsmen, such as Gemma Frisius (1508–1555), Gerhardus Mercator (1512–1594), Gualterus Arscenius (ca. 1546–1580) and Erasmus Habermel (ca. 1538–1606), being active there.

However, I did not primarily select this instrument because of its beauty, historical significance, rarity or exquisite craftsmanship, but rather because it was only 'discovered' in the 1990s, in a secondary school in Lisbon. Nobody knew it was there, it was in an unlocked cabinet in a corridor and was found 'by chance'. If it had not been taken to the museum, preserved and studied, this jewel could have been lost forever. I find this example particularly illustrative of how many artefacts of our common heritage of science – ugly and beautiful, old and recent – remain to be 'discovered' in unsuspected places, brought to light and interpreted to broad audiences.

We know little about the biography of this quadrant. We know that it belonged to the Cabinet of Physics of the Portuguese royal family and that it was at the Palace of Ajuda in the early 1940s, when it was transferred to the above mentioned school to be used for teaching. It possibly was ordered in the sixteenth century by the Portuguese King Sebastian, or it could have come from Madrid at a later date, when Portugal was occupied by Spain (1580–1640). It could even have been acquired in the nineteenth century by the royal family as an antiquity. We are still researching its history. It is somewhat frightening to know that several generations of 15-year olds have learned the basics of astronomy by handling this unique quadrant, but at the same time this is touching and wonderful. Lucky kids.

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The collection of a non-collecting institution: A case study of the Jacob Lawrence Gallery at the University of Washington

KRIS ANDERSON

Abstract

This is a case study of how the Jacob Lawrence Gallery at the University of Washington, a non-collecting institution, became responsible for a collection of some 750 works of all different sizes and media that had accumulated uncataloged and uninventoried over the course of almost 100 years. Numerous decisions had to be made by many parties to address how these objects honor the school's history and the legacy of past faculty and alumni, balance that with the objects' conservation needs and realistic level of resources available, and make the collection available for educational use through integration into the pedagogy of the School's courses. I will the legal hurdles of processing works with no clear provenance, copyright issues, how (as a museum professional) to uphold museum ethics and best-practices in an institution that is not first and foremost a museum and navigating the politics of multiple department interests that could be in conflict to develop a clear and comprehensive collections management policy. All of this was done with no extra financial backing, but with creative cross-campus partnerships with departments such as library science and law.

Introduction

Numerous organizations around the world, from UMAC (University Museums and Collection) and ICOM (International Council of Museums) to the AAM (American Association of Museums), have been consistent advocates for the role of collections in institutions of higher education. They have been leaders in creating taskforces, white papers, and best practices that can be used if ever the value of academic collections is called in to question.

However there exists on campuses around the world, collections from countless disciplines that are not recognized as 'official research collections' and therefore are not under the protective umbrella of the standards created by the aforementioned museum organizations. While they can be obscure collections such as the collection of slide rules in the University of Colorado Mathematics Department, or a collection of hundreds of paintings such as have come into the care of the Jacob Lawrence Gallery at the University of Washington, they are vulnerable to being disposed of, or repurposed, the end result of which is a horrible loss of potential research, and an irreversible decision to devalue and deprioritize the history of the institution itself.

The challenge

Although it was not an original part of the job of gallery director when it was last hired, never the less the director of the Jacob Lawrence Gallery has become the steward of quite a large collection of art works, nearly 1,000, which span over a century. Although that might not seem like a long time as compared to some other global institutions, it is a comprehensive history of arts education at the University of Washington in Seattle. Since the Jacob Lawrence Gallery is positioned on a campus where there are other larger museums, collections were never figured into the strategic plan of the gallery and although the division of art produces countless works of art and scholarship, it is not a collecting institution in its mission. Of course, just because collecting is not part of the mission does not mean that pieces have not been acquired. Whether it is from abandonment or intentional donation and everything in between, for years, without direct supervision, a collection steadily grew.

The collection only came to the attention of the gallery staff two years ago because the main storage space previously holding the work, a leaky basement room under no particular supervision, was being

given to a new division. No one in the building knew what to do with the accumulated work, and so the decision was made to contact the gallery. At that time of contact, the collection had no allies, interest, or exposure. Perhaps you have been handed a similar situation, or you have a colleague facing an orphan collect. Let this server as both a case study and cautionary tale of some of the successes and errors that were experienced in undertaking this project, to help others facing the same hurdle.

Initiating the project

First and foremost there had to be a decision to take action, a conviction that the diverse work could have a multitude of values to a broad range of constituents both in and outside of the school and a conviction that the status quo was not the way to conduct this aspect of our operation.

After the decision to act, the gallery had to come up with a list of reasons and values that working with this collection would provide. Some of the potential values seem obvious, as they are often what are associated with art works, those of aesthetic and artistic value. There was also a broad range of pedagogical values. As an active academy art history and fine art programs would certainly benefit from direct interaction with actual works of art especially a comprehensive collection of the past 100 years. The work also serves as an historical record of the development and success of the school, and lastly, and perhaps most importantly, it serves as a real and tangible way, through programming and exhibition, to honor past faculty and alumni contributions. Certainly there are other ways the values of such a collection could be measured and if faced with a similar situation one should be encouraged to think of as many metrics for value as possible, because every metric found is a different group of advocates that can be encouraged to participate in a project and advocates are key to a project's success.

Soliciting allies

Next, interest needs to be garnered in the project, by letting people know what the collection consisted of and its potential uses in order to secure resources and support; and in order to let people know what the collection consisted of resources needed to be expended in cataloging, photographing and presentation. Thus is the omnipresent museum conundrum, where to get the initial resources to get the resources that we need?

One answer is something that many institutions have turned to in the past and that is volunteers and interns.

The term 'intern' is a difficult one, because interns should be treated as junior colleagues and given substantive responsibilities and trusted to make decisions and execute orders with only moderate supervision. In reality, too often interns are treated as unskilled labor, relegated to tasks such as putting stamps on postcards that do not develop specific career skills. When the Jacob Lawrence Gallery hires interns it is done under the assumption that since they will be doing their work simply for academic credit, the gallery is obligated to make sure that they leave with new and valuable skills for the museum and gallery field, and ideally with a tangible product that can be used for portfolios and job searches.

For this project it was decided that two interns were needed, one that would develop and organize the collection including the collections data, and another whose role would principally be the digitization of the collection. After sitting down and looking at the realistic skill-set needs, the gallery team had to make a difficult political decision and that was to look for interns from outside of the School of Art. The School of Art in which the gallery is housed and which is the owner of all of these art works consists of the divisions of art, art history and design, and each of these groups feels an ownership stake in all of the operations of the gallery. Given the lack of serious internship opportunities for the students of the

school itself, one can receive strong pressures to draw exclusively from within our own pool of students. Although the gallery appreciates the merit of keeping opportunities in house, it is a disservice to oneself and to the student to place them in an internship that is not an ideal fit. Ultimately two students were chosen, one student from the university's museology program and one pursuing a double degree in museology and library science.

Cristina Linclau, the double master's degree student was informed of the desired outcomes and was then given charge and oversight of the day-to-day operations of the project. She took on development of the database, the organization system, labeling, cataloging and condition reporting. The other intern position, which has been held by several students, answered to Cristina Linclau and was principally responsible for moving and capturing digital images of the works to be entered in the database.

Promoting the project

Once there were enough images and cataloged works the gallery was able to peak the interest of one of the regions local arts writers who was intrigued enough to write a feature article about the project in Seattle's City Arts Magazine. The article highlighted the historical potential of the collection and the cataloging project itself and made it clear that the collection is the joint historical legacy of all of the past faculty and students. This was quite a boon for the project and the gallery was able to utilize media exposure to reach out to potential supporters and advocates.

This exposure leads to opportunities to show how the collection could be of value to the greater community. Seattle was the host city for the 40th annual Society of North American Goldsmiths conference and one of the principle venues was the Bellevue Art Museum. The curators of the museum knew that once upon a time the University of Washington offered an art degree in metals, and that there had been a donor who had established an endowment to create a collection of student metal work. But as the metals program had been defunct for years, there was worry that there was no one responsible for the objects, and no one knew who to contact to find out. After seeing the magazine article the museum was pleasantly surprised to find out that not only was the collection in safe hands, but they were also impressed with the speed and accuracy that they were able to not only confirm the safety of the objects, but also how swiftly all necessary high resolution images and label information was provided for an exhibition on Seattle metal arts they were planning.

The common thread between the press article and the exhibition is making sure that the collection is frequently in the public eye. It has been important to not only show that there is a collection but to show that the collection has a broad range of value, just like earlier what the goal was finding stake holders internally at the university.

Legal assessment

There is another large set of concerns in such a project, the question of what to do with the collection is more than just a museum issue, there are strong legal questions about title and copyright that need to be considered. We are fortunate that there is a staff of lawyers on campus that can be accessed for council. One of the lawyers on staff, Clark Shores, is the university's expert on intellectual property law and has been our principle contact for identifying and solving many of the complex issues that go with having a diverse collection of unknown origin. The first question that he had was one of ownership. Who owned this work and was there documentation to support a claim of ownership? If clear ownership was established, were there any conditions or stipulations to the ownership? Lastly, for those that had no clear documentation, how could the university go forward with exhibition, publication or sales?

Clear and undisputable title was only able to be found for about 15%–20% of the collection, and these works could be used at our discretion as the only conditions of the gifts were that any funds from sales go to support students, something that an academic gallery happily endorses. The rest was an orphan collection from a multiplicity of artists over the course of 100 years and our legal council had to make us realize that secure title or publication rights would never be able to be attained to with 100% certainty; rather we needed to think in terms of risk mitigation.

A large debt is owed to the collections department of the Museum of Modern Art in New York for being so forthcoming with their process of dealing with orphan works. After looking at MoMA's policies, the decision was made that the first step was to take artists that could be identified and attempt to send a letter of inquiry to their last known address. Even though some of the artists were long deceased, the purpose of this inquiry was not to yield information, but rather to prove that due diligence had been taken to contact the artist or their representatives with the information on hand, and as expected the process yielded no responses.

The next step was to publish information on the artists and works as a public notice in local newspapers and give people sufficient time to respond. It was decided that two publication of the information with at least 30 days between publications would suffice, again for the purposes of due diligence.

The steps taken are no guarantee that there will not be problems in the future. The title to the works or to the rights to reproduce them in publications, advertisements, or on the web could be challenged. But eventually a decision needs to be made as to what level of comfort is necessary to move forward, because if one waits until there is 100% certainty, they will be waiting forever and the collection would simply be a hindrance and a resource drain. The gallery needed to move forward with capitalizing on the collection, both in terms of financial and intellectual capital.

Tangible results

What is the pay off from two years of hard and mostly volunteer work? The gallery successfully presented the first exhibition that draws exclusively on the works that are in the collection, continuing the process of showing its breadth and depth. This included a limited publication and about 35 works, which although small is something that is building another link in the chain of finding and developing advocates for the collection. In addition, the gallery is in the continuing process of deciding what works we do not want to keep and will begin a process of finding new homes for them, be it a museum or sales, the proceeds of which will be given to student scholarships, reinforcing the educational mission of the school of art.

Summary of steps

First is realizing that despite your best intentions, you have somehow ended up with a collection. Second is to figure out roughly what it is that you already have in your collection and to craft at least a temporary collections management policy so that going forward there is a control to what comes in and what goes out. Third is to set up the infrastructure in terms of space, technology and manpower to be able to catalog the collection. Fourth is to actually do the cataloging. Fifth is to use the collection in as many ways as possible!

And of course while undertaking all of these steps, constantly be bringing the collection and the effort that is being expended to everyone's attention in order to be finding new advocates and allies both inside and outside of the university as they are the ones who will be supporters when the value of work and collections is being questioned.

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Adding value: Universities and their museums

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Abstract

University museums and collections – and the cultural, educational and research potential that they represent to a campus landscape – can appear at times insufficiently recognized by their host institutions as relevant and having the potential to add value to them.

This paper investigates the setting in which museums and collections and Macquarie University are currently situated in, and how that can affect the ways in which they operate.

The sector

In the past couple of decades in Australia, higher education within the university sector appears to have moved towards a managerial style as its operational directive. This re-branding of image – including descriptive language used – now sees students classified as clients; seemingly mirroring the corporate sector in this regard. While the corporatization of higher education has attracted some sustained criticism (e.g. GIROUX 2002), it is a global phenomena that intermingles business and academic cultures bringing both new challenges and new opportunities.

As a result, universities could be categorized as being concerned with defining their core business and distribution of resources (financial and human) to identified areas of significance. In strategic terms, aims are set, plans and policies are prepared, and governance is put in place, structured to achieve tangible, measurable outcomes. These areas then would be supported and favored by a system where those outcomes achieve a financial return, or create opportunities such as substantial government grants, industry linkage, patented products or processes, which give a future financial gain. Hence it is advantageous to ensure that operations within such a university are measurable against set performance indicators. Theoretically this in turn reinforces the reputation by identifying the university's unique qualities and features while encompassing all that it stands for internationally as a saleable asset. The university measures its success by reference to its improved ranking on national or international competitive tables against the performance of other universities.

Managerialism has meant that universities have undergone a change management process, where the process itself, and the outcomes of it, are meant to be positive, inclusive and encouraging, allowing projects and university processes (such as research and learning and teaching) and staff (both academic and support) to reach their full potential in a managed and progressive career path.

The vision and directions at Macquarie University have been set by the current vice-chancellor and his senior executive team, who have set the agendas for the foreseeable future. Outlined in the document, *Macquarie@50*, created by the current vice-chancellor (SCHWARTZ 2006, 2007) and supported firstly by a series of position papers (the *White Paper* from the provost, the *Research Strategic Plan* from the DVC-R) and secondly by the creation of new strategic offices in the areas of social inclusion, sustainability, community outreach, and university advancement. The latter looks to raise significant amounts of money from the general community for the University Foundation as well as faculty-based areas of study. With these documents and structures in place, those within the university, at all levels, have an understanding of where they are collectively headed in terms of institutional aspirations.

When every part and process in a complex organization such as a university is scrutinized as a way of determining what value it brings to the organisation's core business there are inevitably winners and losers. So, those in step with the set agendas could be interpreted as central to core business, and

thus seen as relevant and part of the process of ‘adding value’ to the university. They in turn are valued, and therefore supported and even encouraged, in their future endeavors as integral to university life and operation. This of course raises the questions of how does one maintain relevance and what happens to those deemed to be no longer relevant, redundant or surplus to needs?

UMACs

University museums, collections and herbaria (UMACs) are one section of a university where the question of relevance within the university landscape will become pertinent. Not all university administrators are steeped in the traditions, or an understanding of collections based research and teaching. When staff responsible for UMACs fails to convince administrators of their alignment with university aspirations and business plans, the results will obviously be declining funding and a decreased likelihood of survival. This will happen regardless of the significant nature of any items making up the collection (STANBURY 2003).

UMACs are the second oldest type of museums in the history of museum development, developing in parallel to those in the mainstream. There has always been a symbiotic relationship – and this biological metaphor is important – between universities (through their faculties and disciplines), the collections that have built up around these and the staff employed to run them. It is an organic relationship that needs to be carefully nurtured to prosper.

Collections have often been formed as a result of the acquisitive interests of one or two members of staff, and many of them began life as teaching collections before acquiring space for display and developing into museums. This pattern of development is central to the historical growth and expansion of UMACs around the world, and continues to be the model today. The questions that arise from this history, are where do UMACs fit in the university world in the 21st century, what is the on-going and future relationship to the museums sector and where do they fit in society generally? While the scope of this paper does not offer answers to these questions, it does however raise them as issues for consideration in the future.

Such questions certainly highlight the ironical relationship that is peculiar to UMACs. From a government perspective, sitting within the structural framework of a university, they are generally thought of as representing education, where mainstream, and therefore stand-alone, museums are often thought of as part of arts.

UMACs are subject to university and educational funding, while mainstream museums receive or apply for either direct or indirect government funding at the relevant level. Australia has a three-tier government structure, so support can come from ministers or granting bodies at national or state levels, or from local government budget allocations.

From the point of view of the Australian peak industry museum body, *Museums Australia*, UMACs are thought of as a ‘special interest group’ and do not share the podium side by side with mainstream museums as one might expect when, historically, both have developed in parallel.

Even the acceptance of UMACs as a special interest group is quite recent, the result of two national surveys (AUSTRALIAN VICE-CHANCELLORS’ COMMITTEE 1996, 1998) and a concerted push by those spearheading the research into UMACs nationally to be included in the peak industry body. The history of the relationship between UMAC and non-UMAC workers in Australia has been covered elsewhere (SIMPSON 2001).

The value of UMACs to many with responsibility for them (such as universities and federal government departments), only really took some shape once the total estimated value of these collections was

published (AUSTRALIAN VICE-CHANCELLORS' COMMITTEE 1996, 1998). The identified 257 UMACs in Australia had a combined asset value estimated to be between one and two billion dollars.

In New South Wales, the asset value of a UMAC has to be determined every five years by law for the Auditor-General's department and included in the *Asset Register of the University* (OFFICE OF FINANCIAL SERVICES 2011). This means a cost to the parent body which must pay for the valuation process. It also means for administrators that the results must be included in official documentation, the collections have to be stored securely, and be properly maintained in order to avoid further costs for repair or restoration, and the collections have to be fully insured.

Such on-going costs raise in the minds of university administrators and senior executives the question of, are they getting value for money? Does the existence and operation of the collection warrant the costs of maintaining it? How do they add value to the overall operation of the university?

For the directors, managers and curators of UMACs, there is a need to demonstrate that they are meeting the perceived needs of the changing climates within universities. They have to become strategic about what they do and how they go about this, so as to align ourselves to the branded image and replicate the strategic directions of our parent body. There is a need to become more entrepreneurial, to demonstrate value and worth across all sectors of core business and therefore add value to the overall operation of the university.

Traditionally, many UMACs are small-scale, surviving on the crumbs from a university's big table. Some survive with very few of these crumbs of money, and that can place them on an endangered list. In Australia, research by Simpson (2003) has shown the rapid and quite concerted decline in geological and paleontological collections that have been severely reduced both in specimen numbers and in a corresponding dramatic loss in staff positions. The same situation has also occurred outside of Australia and sometimes prompts interesting solutions (DE CLERQ 2003). Some science collections have suffered severe cut-backs, have been amalgamated to save costs or have disappeared from the UMAC sector altogether (PEARCE & SIMPSON 2010).

The *Macquarie@50* document (SCHWARTZ 2006), has a clear agenda to refocus the institution on the production of measurable research outcomes demonstrating increased research activity to bolster the university's position in ranking tables. UMACs at Macquarie University have had to consider the documents mentioned previously to refine and in some cases, redefine, activities aligning themselves to the new directions and the guiding mantras to give ourselves a competitive edge. The raft of policies and strategic documents that have subsequently been developed at faculty and discipline levels, have to be included in their documentation. University core business is re-envisioned now as focused on (MACQUARIE UNIVERSITY 2011):

- research
- learning and teaching
- quality enhancements
- business and community engagement
- social inclusion
- internationalization
- institutional advancement
- sustainability
- student life

While one could be cynical of these changes, viewing the new playing field from a 'total package' point of view, one can see that there are opportunities for UMACs to improve and maintain relevancy and develop future growth. Although there are approximately ten recognized collections at Macquarie

University, they do not all offer casual access or the possibility of interaction for research purposes. The ones that could be of interest to this discussion are the Biological Sciences Museum, the Australian History Museum, the Art Gallery and the Museum of Ancient Cultures. Macquarie University's UMACs collaboratively approached the task of facing up to the institutional changes by collecting data over the period of one year to address the following nine parameters; visitor statistics, publications, exhibitions, links with teaching units, volunteer participation, grants and other income, publicity, requests from researchers and connections to the CORES (Centres of Research Excellence, a scheme devised as part of the institutional reorientation to a research focus). Some of this data is included in the discussion below. The data represents activity levels before the UMACs responded to the new strategic directions for the university.

The two Macquarie UMACs that are the focus in this paper are the Museum of Ancient Cultures and the Art Gallery. Why select these two as a focus? What makes them an obvious choice is their track record in fostering students and future contributors to the museological field. 2012 will mark the tenth year since the core unit of the discipline of 'museum studies' was first run. The various staff members (curatorial and managerial) of both collections have been ongoing supporters of the growing discipline. The connection here between collections and discipline (even though the collections and museum studies do not sit in the same disciplines) offers its students unique access and insights into progressive museological practice in dynamic and challenging environments.

Adding value: What does this mean for the UMACs at Macquarie University?

Museum of Ancient Cultures

The Museum of Ancient Cultures sits within the ancient history department in the faculty of arts. For the Museum of Ancient Cultures, remaining relevant means a renewed focus on expanding research activity. As well as promoting research of items within its collection, a range of archaeological research is being carried out, or is in the early phases of investigation with individual, or groups of objects. Implicit in this research is publication of results.

In the initial stages of the new university strategic plan, one year of data showed little in the form of published output, there were two articles in a History Teachers' Association journal, two papyrological conference papers based on Macquarie museum material and an article referring to a Greek inscription (MU 3654) on a collection object. It was reported that other research was underway on items in the papyrus collection and publications were being developed on some cuneiform tablets, the discovery of a unique Roman potter's stamp on a bowl in the collection and work on the analysis of a mummified pigeon in the collection. There was no data available on the level of requests from researchers for access to the collection.

The museum was the site of regular discipline specific seminars, but only had formal links with two undergraduate units, one postgraduate units and a number of units offered by the Macquarie Christian Studies Institute, a separate but allied institution with a collaborative relationship with the Department of Ancient History in the delivery of programs. The museum was also used in part of the delivery of museum studies programs representing the only non-disciplinary focused teaching use of the collection and museum space.

The museum has a very successful program of outreach to high school students and is seen as integral to student recruitment in ancient history, one year of patronage attracted over 5,000 paying visitors (for education programs) generating over \$80,000 worth of income. The museum has another value of direct relevance to senior administrators as it is often used as a showcase for visiting dignitaries and is therefore in regular demand through the university's marketing and public relations group.

Because, funding applications align with the new directions of the university, the director has been successful in securing purchase monies to expand the collection. Seeding funding has resulted in a survey season at a prospective new site in Italy; expansion of this to further seasons will be dependent on the museum's ability to attract outside funding.

The community outreach programs and high school curriculum aligned education programs developed on-site build on links with feeder schools – growing potential numbers for the next generation of under graduate students – but also ensuring relationships with schools that can offer valid teacher placements in education institutions for students with ancient history streams. A large proportion of these programs are run within the museum's own gallery space (fig. 1).



Fig. 1 - The Ancient Cultures Museum gallery space © Dr Jaye McKenzie-Clark 2011

Art Gallery

Like museum studies (although museum studies is often structured as an arts subject at other universities), the Biological Sciences Museum sits in the Faculty of Science. The Museum of Ancient Cultures and the Australian History Museum at Macquarie University sit within the Faculty of Arts, and appear to be secure. However, the Art Gallery and Sculpture Park sit outside of any faculty. In the past they reported to the vice-chancellor; today they are under the Office of Institutional Advancement, the university fund-raising body. (Comments here are personal and may not reflect those of the permanent Art Gallery staff.) This relationship with the advancement office would appear to be a mismatch of operations. With the advancement office's focus on short-term fund-raising, operating on a yearly budget that is geared to achieving set outcomes – attracting monies to the university; the unit does not have an academic focus.

In the initial stages of the new university strategic plan, one year of data shows a surprising level of research output given the supposed non-academic focus of the Art Gallery. There were three major catalogues published to align with exhibitions developed, an article published in *Art and Australia*, and two conference papers presented and published, one on the sculpture park at an international conference and one on a former exhibition at a national conference. There was a total of nine different exhibitions in one calendar year. Exhibitions were also reviewed and published by external writers on five occasions during the year. Total number of visitors was not recorded but 52 different groups in the same year were booked into exhibition related activities and events.

Twenty three different teaching units used the Art Gallery during the year including indigenous studies, creative arts, cultural studies, early childhood studies, anthropology, law, English, museum studies, philosophy, marketing, physics and sociology.

The Art Gallery also works closely with the university's marketing and public relations group and is also a common destination for dignitaries and a common venue for a range of conferences held on campus that will often align with a specific exhibition.

Since then each subsequent year the Art Gallery, with two permanent staff (and contract staff employed as necessary, and when the budget allows) undertakes to research and produce unique shows that correspond to university priorities and directions and align with various faculty research initiatives. Its web site declares that the art collection offers a "broader understanding of the arts and culture to the wider community that highlight the importance of visual art and culture to education and

research" (MACQUARIE UNIVERSITY ART GALLERY). A recent example of the ability the gallery has to reach diverse audiences would be the partnership of the Art Gallery and the Department of Physics in the production of an exhibition highlighting the importance of a highly influential holographic artist in 2010, planned to coincide with the 50th anniversary of laser technology (DAVIS & JANISZEWSKI 2010; fig. 2). While the Art



Fig. 2 - The Macquarie University Gallery during *Virtual Encounters: Paula Dawson – Holograms* (HAMMOND & JANISZEWSKI 2010) © Effy Alexakis, Photowrite 2010

Gallery often explores scientific themes in its exhibitions, this was an exploration into a medium not readily available to the viewing public, or to students of either physics or arts. This reach was further extended, as it toured to Newcastle Regional Art Gallery after finishing at Macquarie University.

Considerable long-term negotiation takes place to arrange major loans and access archives for these shows. This process can take years to achieve the planned six-yearly exhibitions and production of publications based on the research for each planned project. The staff members from the Art Gallery are research active, which aligns with the university core business directive – but which does not figure in the Office of Institutional Advancement's mission, which is specifically to undertake fundraising appeals and campaigns across the campus to create significant new revenue streams.

Many exhibitions are themed around various aspects of the existing collection that itself is significant. These are installed and rotated in the Art Gallery space, while until recently a major portion of the collection was also on permanent display in the old library space. That has now disappeared as the

old library has been closed up and the new library does not accommodate the permanent art display. Such decisions are financial, given that, like so many others, there are budgetary constraints.

A line of discussion sometimes raised concerns the validity of a university that does not offer 'fine arts'. This then leads to tired arguments over the expending of capital on an art gallery (and its collection) that produces the quantity of changing exhibitions that Macquarie University's gallery does each year. Fortunately, the university is not so short sighted as to enter into this uneducated and out-of-date line of debate. Such an argument would ignore the value of art to all educatory pathways and to the on-campus quality of experience offered by access to quality visual art as inspiration for education and research purposes.

Although the various university faculties that interact with it are aware of its potential, the location of the art gallery within the current university structure could be interpreted as problematic and counter to the inclusive nature of both the exhibition space historically and the research focus of the university's current directive. Attachment to the advancement office could be interpreted as an exercise in window dressing for fund raising purposes and therefore a complete compromise of the intellectual integrity of the art gallery per se. As part of the advancement team, the art gallery staff undertakes to fulfill roles set out by their management team – as well as the core business interests of the university. Fulfilling the role required by the Office of Institutional Advancement, while trying not to jeopardize the long-standing relationships with galleries, artists and other institutions built up over years, offers its own set of challenges but is unavoidable, as failure to comply could spell a threat to the long-term survival of the art gallery.

Conclusion

Although limited by permanent staffing numbers and budget constraints necessary in the current economic climate, both institutions work towards meeting the core business directives of research, learning and teaching, community engagement and social inclusion. Currently there is no suggestion that either collection is under any immediate threat – however there is an imperative on those that run these collections to continue to work at ensuring those collections are seen to value and align tightly with the strategic directions and academic purposes of the university. It is inadvisable to assume one can rely on benevolence as a survival tactic.

While Australia was fortunate to survive the Global Financial Crisis (GFC) relatively intact, some areas have not fared so well. The pressure as governments' make adjustments in this weakened climate has the potential to affect all levels of the economies of scale – it may be that in the future UMACs can expect to bear additional pressure on their collections to those they currently experience. Hence the increased need to continually re-assure the parent body of the value its own UMACs adds to the university core business.

Post Script

This paper was presented in September 2011. This year the current vice-chancellor has announced his intention to retire by the end of 2012. Additionally, shortly after this paper was presented, at his request the Macquarie University Art Gallery has been re-located to sit administratively within the Faculty of Arts. Transfer of responsibility for the gallery budget to that faculty will be effective of January 2012. It will be of great interest to see how the Macquarie University Art Gallery develops under this new reporting structure.

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Intangible histories and the invisible technician

LYDIA WILSON

Abstract

It is the technicians in a university science department who often provide the most continuity: they have a permanence and a range of activities that, in the course of their time at a single lab, they often see come and go a series of research groups and instruments. In a fundamental sense, it is these technicians who in fact control the material substrate of university memory. By building on case studies from oral histories with technicians at the University of Cambridge, this paper will explore what their perspectives offer the preservation of university heritage.

Introduction

Much work has been done in exploring the intangible and invisible aspects of objects.¹ In the case of scientific material, collection and display would ideally include such aspects, for example information about the sites of both production and use; the uses of the objects and how these changed; how the instruments themselves were adapted for changing research and teaching demand; relationships to other instruments and perhaps other research groups or; how successful or otherwise they were; and, crucially, in my own research, the attitudes and feelings of the users towards them – the scientists, technicians, craftsmen, and students.

This paper concentrates on the role of the technician in the preservation of scientific objects, and also as a repository of intangible histories of the objects. The “invisible technician” of my title refers to the seminal paper by Steven Shapin about the unacknowledged roles played by technicians in the 17th century, focused on the crowd of ‘extras’ around Robert Boyle.² Published in 1985, the paper concludes with reflections on ‘modern’ (that is, the situation in 1985) distinctions between the roles of scientists and technicians, noting the variations between theoretical and practical disciplines, different sized laboratories, different countries and political and organizational structures.³ He notes the range of attitudes to and roles of technicians that these differences of context result in, but says that his are only “speculations and impressionistic remarks” because of “our systematic ignorance about the scientist-technician relationship in modern science”.⁴ Happily, since his paper (and perhaps in part thanks to it), technicians have been increasingly studied by historians of science in terms of hidden forces shaping scientific practice, culture and results.⁵

I draw on these ideas to explore how technicians are shaping the history of science itself, that is, how their actions fundamentally affect what material heritage is preserved for the future as a direct result of their role in departments. These roles, as Shapin points out, vary widely, but commonly include the control of the transit of objects between research projects, and from research to teaching labs, and, ultimately, from the lab (whether research or teaching) to the disposal skip. They thus have an overview of the full life-span of these objects which scientists mostly do not have. They also have a detailed knowledge of the different uses and problems of the instruments which is invaluable in contextualizing instruments for historical research or teaching purposes; an overview which is aided by a chronological continuity in their institution which scientists generally do not, given the nature of

¹ For perhaps the most intangible aspect of objects, that is, their emotional contexts and reception, see TURKLE 2007; TURKLE 2008.

² SHAPIN 1989.

³ Ibid., 562.

⁴ Ibid.

⁵ See, for example, BARLEY & BECHKY 1994; LATOUR & WOOLGAR 1986; KNORR-CETINA 1981. For work accomplished by non-scientists more generally, see STAR & GRIESEMER 1989; SECORD 1994.

academic careers. “[T]he price of technicians’ continued invisibility is an impoverished understanding of the nature of scientific practice”⁶ says Shapin, and this is still the case for an understanding of the nature of preservation of the material culture for future historians of science.

With the typical career mobility of a scientist comes a lack of institutional memory, especially in such issues as heritage, which are not always perceived as central to a science department and so there are not internal preservation mechanisms and policies in place. There is also a tension in many departments between recognizing a successful past and facing a competitive future. An example is the case of a department which will remain nameless: the last head of department was very heritage minded and provided funding and impetus for a variety of projects including a permanent exhibition space in a seminar room, the provision of a permanent storage room for heritage objects and setting up a cataloguing project for these objects. With the new head of department these initiatives have stalled; there has been no more work on cataloguing, and funding for upkeep has lapsed. When interviewed, he said that funding bodies were not interested in past Nobel prizes but future ones, and that it was his job to sell the department as a modern, forward-looking research institution and not somewhere living only on its past reputation. There are many other instances of the shortness of institutional memory, and one of the major challenges of preservation of university heritage is how to provide stability and continuity. In terms of the preservation of intangible history – that is, the contexts of the material heritage – technicians are key.

The technician’s role in this process of preservation is often unconscious – after all, it is not their job to think about history, but to run a lab, which includes periodically making space for new equipment and thus disposal of the old. Of course, some *are* interested specifically in object preservation, though this is not the majority in my experience of visits to the science departments of the University of Cambridge. This does not mean, however, that they are not interested in historical matters more broadly defined. In my experience it is quite the opposite; technicians are full of information and stories about the history of their department. One of the aims of my research is to find out their attitudes to their equipment and its history aside from their actions, or what they claim to be important to them, in their everyday work.

Another problem is in the definition of ‘heritage’, which is often more broadly defined by a historian than by a scientist or technician; objects connected to ‘normal’ scientific practice or to teaching are often not valued given their ‘ordinary’ identity, often mass-produced natures, and sometimes low monetary value. But the opposite is the case for many different audiences of scientific heritage: knowing how science is or has been taught is crucial for historians of science to understand the day-to-day functioning of science. Moreover, from the museological point of view, teaching equipment, for example teaching models, is relatively accessible to the public, designed as it is to explain scientific principles and processes to beginners, and often of convenient size.

Two case studies of technicians in different departments of the University of Cambridge are outlined below, both illustrative of the continuity already mentioned. The techniques I use to gain insight into these contexts are drawn from oral history. Given that many interviewees do not react well to formalized interviews, informal chats, on some occasions, be more productive. In the future, a photo archive will be created, which ideally would portray certain relationships between object (the instruments, specimens, models or material), person (scientists, technicians or students) and environment (the lab or technician’s office).

⁶ SHAPIN 1989, 563.

Case study 1: Chemical engineering

The categorization of 'heritage' is particularly problematic in the Department of Chemical Engineering and Biotechnology, where hardware lasts a long time and there are many short-term student research projects each year, requiring a large stock of functioning equipment which may or may not be used again for years. Thus some items that we might view as potentially heritage items, or just plain 'old', are not old in terms of the technician's job; 'old' in this context, for the technicians, means obsolete, which mostly means broken. Even then, bits and pieces can be rescued and recycled, making the preservation of scientific heritage of this department a challenging task.

One of the two technicians in the department is a hoarder and meticulous cataloguer. As he sees it, these are both fundamental duties of his job. He proudly claims that he can always lay his hands on what a student might need even if it was last used in the 1960s. But he says that his hoarding is for scientific purposes only and he has no qualms in getting rid of things which are broken. He claims not to be interested in preserving objects for historical purposes, an attitude which, later in the interview, is contradicted. For example, I asked him to show me his favorite piece of equipment – a request I often finish visits with, in order to get a more spontaneous reaction. "Come into the basement" was the intriguing response, where he showed me a big metal case, perhaps 2 meters by 1 by 1, with many multicolored wires inside. It was hard for me to give a response, because its function was opaque to me, a novice, but he didn't seem to need one; instead, he told me that his colleague had suggested cannibalizing it for its parts as it took up valuable room. He replied to his colleague: "you can't chuck that out! I told him – I made it myself! It's my baby!" and so on. Thus he does hold onto equipment for reasons other than the purely functional: he showed, with this example, a clear emotional attachment to an object.

This attachment to objects is encouraging from the point of view of preservation, but how are we to build on it? The technician's input is crucial if a specific instrument is chosen to be kept for historical reasons,⁷ as are his memories covering construction (including the background of the constituent parts, so carefully catalogued and stored), use (by himself, scientists and students) and adaptation. He is the only person in the department who knows the full story of a piece of (to me, indecipherable) equipment in the basement. Furthermore, it sheds light onto my research concerning attitudes to equipment in science departments in general, but that is for another paper.

What is clear from the example is that oral testimony is invaluable, even indispensable in certain cases, to preserving material heritage. If considerable scientific expertise is required to understand the function of an object, or if the object is 'black box', as is the case with the technician's instrument in the basement, or both, the value of preservation without supporting contextual material is diminished: this example shows that it is the technician who is the repository of this requisite knowledge.

Case study 2: Quaternary Research

The subject of Quaternary Research (that is, research into the last 2.6 million years) has had a long and tumultuous history at Cambridge. Founded as a sub-department in the Department of Botany under the aegis of Harry Godwin in 1948, it was dispersed in the 1970s to a large number of departments (earth sciences, geography, archaeology, zoology and the Scott Polar Research Institute being the main recipients of researchers). In 1995 the Godwin Institute of Quaternary Research was formed, but rather than being placed in a single building or department, this new institute had a flexible

⁷ The aspect of choice in the preservation of scientific heritage is a whole other can of worms which I will not open here. Much work is being done on this all over the world, for example at the University of Toronto, the University of Leeds, the University of Lisbon, the Scientific Heritage Project at the University of Cambridge and many others; research into these initiatives is one line of enquiry being pursued by the newly-formed Universeum Working Group for the Preservation of Recent University Scientific Heritage. I look forward to the results from this Working Group.

structure involving collaboration between all the departments with Quaternary content. In 2005 an even more informal structure, Cambridge Quaternary, replaced the Godwin Institute.⁸

The importance of this case study from my point of view is that throughout all these shifts a collection of objects and documents has been accumulated and preserved, and is now housed together in one room in the Department of Geography.⁹ It is being carefully guarded from the constant threats of space requirements by two long-term members of the research group, one a lab technician, who are also cataloguing and researching and putting material up online.¹⁰

This technician is passionate about the preservation of the history of the research group, and works hard in his spare time to organize, catalogue and photograph the store-room of rescued items going back to the foundation of the sub-department in 1948 (a collection which includes specimens, field notebooks, reports and minutes of the department, microscopes, lecture slides, recording equipment, and much more). He seems to have the entire history, including knowledge of objects and materials held in a store-room (labeled 'museum' on both the door and the website), at his fingertips and is thus a crucial source for the contextualization of objects preserved. Why the marked difference to chemical engineering? Perhaps one difference is that he has a PhD in the field and so a personal academic connection with the discipline. But I think it has more to do with the specific, tumultuous history of Quaternary Research in Cambridge, including political difficulties. This socio-political context of the struggle to survive has also affected other major players in the discipline who are working hard to preserve its history, with a sense of responsibility for material that is threatened by a lack of institutional recognition. This has been made explicit by the current group coordinator of Cambridge Quaternary, who says that they are the guardians of the history and heritage of the whole endeavor of Quaternary Research in Cambridge.

This technician's work on history of Quaternary Research is entirely separate from his regular duties. It is encouraging that virtually nothing has been thrown away in the process of the multiple moves (and the rare items that have been thrown out are mourned), but again, even in this historically-sensitive environment there is the assumption that much of the modern material, especially the teaching equipment, is not interesting or valuable; the emphasis is on the equipment, specimens and so on which were used by major researchers who are no longer working i.e. material over 20–30 years old. This example thus works as a reminder to those concerned with preservation of more recent science: policies or guidelines for disposal of very recently obsolete equipment are essential even in those departments looking after their history.

Conclusion

There are many people across the University of Cambridge working hard, often in their spare time, in looking after the material heritage of the sciences in one aspect or another, from one point of view or another. They may be 'invisible' to historians of recent science, but they and their activities are often well-known in their departments, as is clear from responses to my enquiries to the heads of department, who virtually always know instantly who will be able to help me, whether that is a technician, librarian, archivist (both official and unofficial, that is, trained archivists employed as such, or members of the department who take on the role and title), scientist or retired member of the department. There are countless hoarding scientists whom I stumble upon from time to time, and many collections, catalogued and uncatalogued, throughout the university.¹¹

⁸ For more information to flesh out this very brief sketch see, for example, www.quaternary.group.cam.ac.uk/history/ (accessed November 22, 2011); SMITH 1997; SMITH 2009.

⁹ For more on this case study, see WILSON 2012.

¹⁰ See www.quaternary.group.cam.ac.uk/museum/ (accessed November 22, 2011).

¹¹ For more information see WILSON 2012.

There are many more similar examples – and it is encouraging that there is so much laudable activity throughout the University of Cambridge – but what I hope I have shown in this paper is that, whatever else may be happening, technicians are involved in all aspects of the lives of objects in scientific departments and need to be recognized when collecting and preserving scientific material heritage. They cannibalize instruments, and as a result are often the only people who remember the full range of past uses of equipment. They will talk of the not-so-successful experiments that scientists will often avoid mentioning, or think are unimportant to the history of science. They are involved in day-to-day teaching and research across large numbers of research topics and crucially over large time spans, thus providing continuity of contextual knowledge over areas of research, type of activity (that is, teaching, research and maintenance) and time.

A further line of enquiry stemming from these observations would be to explore the relationship between scientist and technician (as Shapin suggests in the context of scientific practice) for an increased understanding of attitudes to and practices of preservation. There is often a sense of shared history, work and ownership between scientists and the technicians they rely on, though this seems to be diminishing with increased workloads of the technicians, and their increasingly thinly spread expertise over more research groups than they previously had responsibility for. Conversely, there can be tensions between division of labor, expertise and ownership of research and equipment. This is not an area in which I have much data yet, but from initial interviews I feel it is worthy of further consideration.

For all those concerned with the preservation of scientific heritage, technicians are an immensely valuable resource. As I have argued, they are repositories of valuable knowledge of intangible contexts of use and production, vital to history of science and museology alike. But it is also imperative that this expertise be utilized in another aspect of scientific heritage, and that is the establishment and implementation of preservation and disposal policies. Technicians thus have a range of roles, some absolutely vital, in the task of preserving university heritage; to ignore them is to impoverish this endeavor.

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Correlation between instrument collection and archive sources of the Faculty of Physics of the University of Barcelona

SANTIAGO VALLMITJANA

Abstract

The collection of scientific instruments for teaching and research of the Faculty of Physics of the University of Barcelona is under study to increase the information and knowledge of each item. The main sources of information are related to text books and external sources such as databases, catalogues, other collections and museums, etc. But one of the most important sources of information about the origin and function of the instruments is present in the university itself, in the libraries and in the various archives.

This paper illustrates, with examples, some strategies used for obtaining more information about several items of the collection.

Introduction

The Faculty of Physics of the University of Barcelona has a significant collection of scientific instruments for teaching and research accumulated over more than one hundred and fifty years. It is a relatively recent collection, its recovery having been initiated in the 90s (VALLMITJANA 2011).

In order to acquire good knowledge and information of the whole collection of scientific instruments, a series of questions arise; for example, what is their purpose, function, provenance, manufacturer and how are they to be stored, conserved and restored. The answers to all these questions are usually to be found in different archives and sections in the university: in the libraries, archives of inventories, records of meetings, agreements, agendas, records of the official teachers, records of purchases and invoices, records of syllabus, courses and time-tables, etc.

Obviously there are other very valuable external sources of consultation, such as other university libraries, collections, museums, databases, and it is especially useful to consult these entities through the internet, but the present work focuses on internal sources. In this communication various information sources at the University of Barcelona are described with some examples, all related to the data acquisition process for the collection of scientific instruments of the Faculty of Physics.

Main source of information: Text books

One of the most important sources of information about the function of the instruments is present in the libraries of the universities, particularly in text books. Physics text books very often provide good information that describe devices illustrating various principles of physics.

The Group of Libraries of the University of Barcelona has built up a huge collection of different documentation organized in a catalogue with access to all the available documents in the libraries (books, magazines, multimedia and electronic resources, sound recordings, videos, etc.) and to a collection of important old and rare books (CRAI).

Concerning our collection the most suitable books are those associated to scientific content.

Physics text books

Particular to scientific instruments, the ideal books related to physics, experimental physics, and scientific instruments are in the library of the physics and chemistry faculty (CRAI).

We have looked at physics books between the years 1825 to 1935 and an initial list of 359 books was compiled. After a work of filtering and selecting, a new more useful list has been reduced to 35 items.

For example, we have the text books of Jean-Baptiste Biot (1774–1862), François-Sulpice Beudant (1787–1850), Pierre-Adolphe Daguin (1814–1884), Nicolas Deguin (1809–1860), César Despretz (1798–1863), Charles Drion (1827–1863), Émile Fernet (1829–1905), René-Just Haüy (1743–1822), Jules Jamin (1818–1852), Gabriel Lamé (1795–1881), Antoine Libes (1752–1832), Jean-Claude Péclet (1793–1857), Claude Pouillet (1790–1868) but perhaps the most useful and best known is the Adolphe Ganot (1804–1887) *Traite Elementaire de Physique Experimentale et Appliquée et Meterologie* appeared for the first time in 1851, with more than 20 editions in France (SIMON 2011). This book has also been translated into Spanish by José Monlau (1862), A. Sánchez de Bustamante (1870), and Eduardo Sánchez Pardo (1881).¹

It is also interesting to look at the textbooks written (or sometimes translated) by the same teachers who taught the subjects of physics and experimental physics in the university itself, as can be seen in below.

Catalogues

The scientific instrument catalogues are an important source of information, because they provide an easy means of identification as well as information about the manufacturer. They are especially important in the case of objects with missing parts and the identification of rare cases. Unfortunately there are few instrument catalogues in the archives of our university, but we have made good use of catalogues of other universities (SMITHSONIAN INSTITUTION; UPC), for instance.

The professors who teach physics subjects. Staff personal files

The analysis of textbooks written by professors of the university has also been of significant importance. In the archive unit of the University of Barcelona there is a section of personal files of the teachers who were on the teaching staff. Specifically in the nineteenth century, we can mention the following teachers who taught physics subjects in our university.

Pere Vieta Gibert (1778–1856) was teaching between 1808 and 1837 in the *Junta de Comerç, Escola de Física Experimental* (School of Experimental Physics of the Board of Commerce). In 1818 he translated the *Traité complet et élémentaire de physique* by Antoine Libes (1752–1832) He was professor at the University of Barcelona in the years 1838–1840 and later in 1845–1856. In 1840 he translated *Éléments de physique experimental et météorologie* by Claude Pouillet (1790–1868) (PUIG-PLA 2006, 544–546).

Antonio Rave Bergnes (1818–1883) taught physics and chemistry between 1846–1856 in the University of Barcelona and later, became professor 1857–1883. He made a very useful inventory consisting of a list of equipment and objects in the physics cabinet of the Faculty of Sciences in 1868, which is described later.

Bartolomé Feliu Pérez (1843–1918) was between 1880–1895 professor at the University of Barcelona. In 1878 he wrote *Curso de Física* (FELIU 1883).

Eduardo Lozano y Ponce de León (1844–1927) was professor at the University of Barcelona between 1884–1899. In 1893 he wrote *Elementos de Física* (LOZANO 1891).

Eduard Fontseré Riba (1870–1970) was professor at the University of Barcelona between 1900–1940. In 1911 he wrote *Elementos de ciencias físicas y naturales* (FONTSERÉ 1911).

Eduard Alcobé Arenas (1867–1945) was professor at the University of Barcelona between 1901–1937 and in 1925 wrote *Física General* (ALCOBÉ 1925).

¹ Edited 15 times.

Other sources of information

Inventories

A great deal of information can be extracted from lists and inventories. In the general archives of the University of Barcelona, there is an inventory of the scientific instruments dated 1868, written by Professor Antonio Rave.²

The origin of this list is associated to an educational reform related to an attempt at standardization. In 1846, on 15 October, the minister of education Pedro José Pidal Carniado (1799–1865) published in the official gazette, a catalogue-model of the machines and instruments necessary for a chair of experimental physics. A set of 153 items with the price in FF from the catalogue of Lerebours and Pixii were described (SIMON, GARCIA-BELMAR & BERTOMEU-SÁNCHEZ 2005).

In our archives we have found a letter from another French instrument maker Jules Salleron (1829–1897), with a list of scientific instruments and their prices, sent to Antonio Rave, and another letter with the selected instruments ordered in 1864,³ as seen in fig. 1.

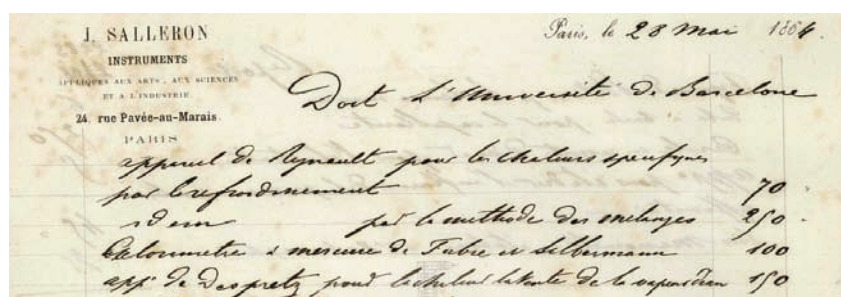


Fig. 1 - Letter of the instrument maker Salleron with selected instruments and prices ordered by Antonio Rave in 1864.

The next document related to this equipment is the aforementioned inventory of 377 items contained in a “List of equipment and objects in the Cabinet of Physics of the Faculty of Sciences” handwritten and signed by Professor Antonio Rave, on Barcelona, on June of 1868⁴ (see table 1).

The analysis of this list resulted in a study of the provenance of the present collection (VALLMITJANA 2012). If we look at the coincidences or agreements between the elements of this 1868 inventory and the present collection, we find only 35 identified elements (and some of them with some uncertainty). The reason for this small number is clear, because the present collection has a large number of elements acquired later than 1868. Moreover, it is very likely that a good many of the old instruments have been lost, especially if we consider the changes of location of the university between 1842 and 1872, the lack of conservation protocols, etc.

A step forward in the study of the present collection was made by analyzing the makers of the scientific instruments. Among these 35 identified instruments from the 1868 list, 26 belong to unknown makers and only 9 to signed makers. Other conclusions were that the 1868 list agrees with the recommended list of 1846 and moreover, there was a marked increase in the number of items. Few instruments have been preserved to this day. Very few instruments from the 1868 list have been correctly identified. About half of those with no maker's signature were probably made by local makers.

² Archive of the University of Barcelona, document with reference ES CAT-AUB 02 25-2-7-4.

³ Archive of the University of Barcelona, document with reference ES CAT-AUB 02 25-3-5-4.

⁴ Archive of the University of Barcelona, document with reference ES CAT-AUB 02 25-2-7-4.

Contents of the 1868 inventory	
Fields	Items
Mechanics and gravity	26
Hydrostatics and hydrodynamics	34
Pneumatics	27
Capillarity and molecular actions	9
Dilation and thermology	20
Vapor and hygrometry	24
Heat radiant and conductivity	18
Heat and pyrogeny	11
Magnetism	10
Static electricity	50
Dynamic electricity	42
Optics	53
Acoustics	26
TOTAL	350
Glass containers and tools	27
TOTAL	377

Table 1 – Handwritten list of equipment and objects in the Cabinet of Physics of the Faculty of Sciences, signed by Professor Antonio Rave, in Barcelona, June 1868.

The analysis of this list resulted in a study of the provenance of the present collection (VALLMITJANA 2012). If we look at the coincidences or agreements between the elements of this 1868 inventory and the present collection, we find only 35 identified elements (and some of them with some uncertainty). The reason for this small number is clear, because the present collection has a large number of elements acquired later than 1868. Moreover, it is very likely that a good many of the old instruments have been lost, especially if we consider the changes of location of the university between 1842 and 1872, the lack of conservation protocols.

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Annual reports

In the general archive are preserved many annual reports, which describe the inaugural speech of the academic year, the statistics of students enrolled in each faculty and the students who have completed Bachelor's degrees. But more interesting is that some lists are also grouped by faculties, subjects and the teachers who taught them. These directories (some of them) are available between 1858 and 1977. For example, in the academic year 1865–1866 we can see how the aforementioned Antonio Rave taught experimental physics (DIPOSIT DIGITAL).

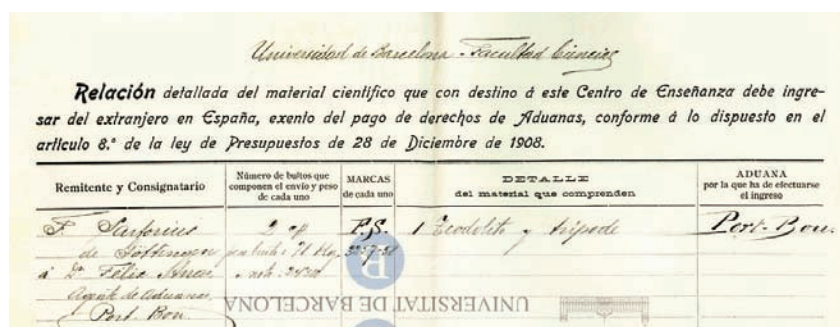


Fig. 2 - Record of exemption of customs duties for a Sartorius theodolite in the period 1905–1912.

Archives of purchases

There can also be found in the general archive, but only in the period from 1905 to 1912, purchase invoices and papers for customs exemptions. Looking at these files we have found a reference to a Sartorius theodolite of our collection, which contains the serial

number, which has given us the exact date of entry, 7th July, 1913, as seen in fig. 2. Other examples concerning importers and local manufacturers could also be cited as complementary data for the study of the collection of scientific instruments.⁵

Documents of donations

The Faculty of Sciences has a large double refractor telescope with equatorial mount made by the French instrument maker Mailhat, with a 22 cm of aperture; it was donated. In the general archive we found a document explaining the details of the donation, how this telescope reached the faculty, the works of implementation of the instruments and the mounting of the dome in 1918 and the final document signed in 1923.⁶

Archives of faculty boards

In the reserve area of the library of the university, records of all meetings and faculty boards from 1876 are kept. The minutes of faculty boards record significant agreements that were made, so they are a very valuable source, because on several occasions decisions regarding the purchase of instruments for teaching or research are shown.

Thus, we can cite as an example the fact that in 1905 the Faculty of Sciences acquired an equatorial refractor telescope of 5-inch aperture from the Irish firm Grubb, and a faculty board of 13th May 1901 mentioned that Professor Tarazona thanked the university for the construction of a shed in the garden of the university, with a Repsold theodolite. Four years later the dome and the telescope were also mounted in the garden.

Another more modern example is found on December 11th, 1964, when the minutes cite that the first electron microscope had arrived at the Faculty of Sciences.

Other less orthodox sources of information

Conversations with colleagues

Oral information may also be a good source of information, such as in the following case, referring to a case of missing documents.

The above mentioned Grubb telescope was acquired through the initiative of Professor Ignacio Tarazona. Initially, there was no information about the purchase in the archives of the university. Thanks to comments with colleagues from the department of astronomy of our university, we found out that the department of astronomy at the University of Valencia has all the documentation of the purchase (an enlightening detail in this story is that Professor Tarazona moved to the University of Valencia in 1906).

This documentation contains more than 70 letters between Ignacio Tarazona and the instrument maker Howard Grubb during the period 1902–1905. The analysis of this documentation has permitted the reconstruction of the whole story.

It would appear that Dr Tarazona obtained the chair of cosmography and physics of the globe at the University of Barcelona in 1898, and promoted the acquisition of the Grubb telescope of 5 inches, a 4m diameter dome and associated accessories. These letters offer all kinds of details of a long and complicated process. For instance, the price was £252, the dome arrived in the summer of 1904 and the telescope arrived in the spring of 1905. He occupied this chair until 1906, when he returned to the University of Valencia, where he took possession of a chair also of cosmography and physics of the

⁵ ARCHIVE UB c. Archive of the University of Barcelona, document with reference ES CAT-AUB 02 26-5-6-20.

⁶ ARCHIVE UB d. Archive of the University of Barcelona, document with reference ES CAT-AUB 02 25-1-8-6.

globe. On his return to Valencia, he took with him all the documentation concerning the purchase of the telescope. More information about this professor appeared in 2008 in an excellent complete study about astronomy and astrophysics in Spain in the period 1850–1914 (RUIZ-CASTELL 2008, 92–98).

The paintings

The pictures and paintings that decorate various rooms of the university also reflect a good deal of information about the status of culture and society at different times. In particular, there are sometimes paintings of scientific instruments, and it is in connection with this that we come to the last example.

In the physics faculty there is a low-powered telescope with azimuth mount for training purposes signed by *Viuda de José Rosell, Barcelona* (Vda. Means widow). From other studies we have limited information on this company from Barcelona. Jose Rosell began in business in 1837, in Plaza Palacio 13 or 15. He died on an unknown date, but his widow maintained the optical workshop until 1905.

But in the largest room of the historic building there are several pictures, and in one that refers to an allegory of science, the telescope is clearly visible as shown in fig. 3. Because the architectural data and paintings are well documented, we know that the picture was painted by Joan Vicens Cots (1836–1885) between 1881 and 1883 (ALCOLEA 1980). This date helps to refine the dating of the telescope considered, so thanks to this painting we can improve on the dating of the instrument.



Fig. 3 - Picture in the *Paraninf* (Largest Room) by Joan Vicens Cots (1836–1885) dated between 1881–1883.

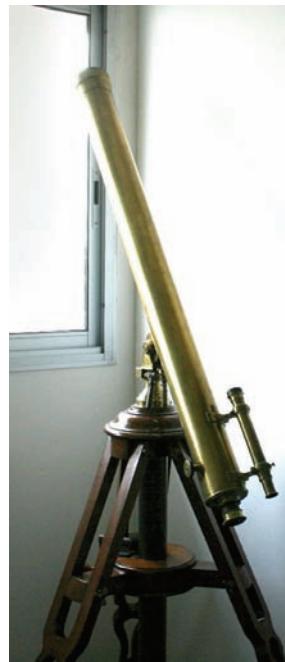


Fig. 4 - Telescope manufactured by Vda. J. Rosell, Barcelona.

Conclusions

We have seen through several examples, that we can expand the information on the collection of scientific instruments of the Faculty of Physics by looking in the different sections of the archives and libraries of the University of Barcelona. However, there is not always a clear connection between these different sections and the searches are not always easy and the management is not agile enough. Although nowadays the archive

unit is performing a task of conversion of card records into digital records and a progressive scanning of documents, it would be useful to establish a review of the structure of the contents of the files and to create databases with different query retrieving keys leading to different sections.

A more general conclusion is focused on the importance of promoting the creation of databases and an appeal to different universities to be able to create affordable databases to exchange information between them. It would also be desirable to create unification of criteria and tools and a

standardization of digital systems to make global information for museums and university collections possible in the future.

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The 'Ferreira da Silva' Chemistry Laboratory: a valuable asset in a university collection

MARISA MONTEIRO & LUIS BERNARDO

Abstract

The relevant scientific and teaching activity in chemistry the Polytechnic Academy of Porto was involved in, at the turn of the 19th century, led to the decision of assigning a significant area of a building under construction for a new analytic chemistry laboratory.

Several reasons are given why the Museum of Science has been proposing that this laboratory, a superb example of the University of Porto's heritage, named after the prestigious chemist and Professor Ferreira da Silva, should be considered an item in itself in the museum's overall collection, for its various valences, restored to its most valuable architecture and so preserved, to be appreciated also as a privileged exhibit scenario for the scientific instrument collection.

The beginnings of the teaching of chemistry

The teaching of chemistry in Porto goes back to the days of the Royal Academy of Navigation and Commerce (Academia Real de Marinha e Commercio). This academy was founded in 1803, in the aftermath of the success attained by two earlier classes, Nautical Class (the Aula Náutica, 1762) and Sketching and Drawing Class (the Aula de Debuxo e Desenho, 1779). It was run by the General Company of the Agriculture of the Upper Douro's Vineyards (Companhia Geral da Agricultura das Vinhas do Alto Douro) – a highly privileged and powerful guild of Porto wine producers and merchants, created in the mid-18th century – and financially supported by taxation on the consumption of wine in the district. Agriculture was one of the courses to be given by the Royal Academy from the very start, though its actual debut occurred only in 1818 (BASTO 1937). The syllabus comprised botany, to which basic notions of chemistry seem to have been associated, as inferred from the notes published in 1827 by the senior lecturer, Agostinho Albano da Silveira Pinto (1785–1852), *Primeiras linhas de chimica e botanica, coordenadas para uso dos que frequentam a aula de agricultura da real academia de marinha e commercio* (*Elements of chemistry and botany for the use of those attending the course of agriculture in the royal academy of navigation and commerce*).

Yet, chemistry as an independent subject emerged only out of the profound educational reform that the country went through in 1837. High schools were created in every district's major town, a Polytechnic School was founded in the capital, and Porto's already decadent Royal Academy was replaced by the Polytechnic Academy.

The Polytechnic Academy offered for attendance eleven different subjects, where the ninth was "chemistry and chemical arts". The prolific romantic-early realistic writer Camillo Castello Branco, who produced quite a number of vivid and often humorous chronicles on Portuguese life for half a century, left us a short account of the chemistry classes he himself attended at the academy (1866, 245):

"It was twenty two years ago! [...] I was studying Chemistry at the Academy in Porto. I only remember well two of my schoolfellows: one of them was the best student in class; the other one, who came last in the list, would be the worst student, if I myself was not there. [...] Our lecturer, Father Joaquim de Santa Clara de Sousa Pinto, never had the pleasure of listening to us. When he summoned us, either we could not be seen, or we had not seen the compendium, which by the way was called *Lasagne*, I think. I would not bet on the spelling. We retreated from class crouching, when God's sun drove us to rebellion. How sadly I saw the sunlight and envied my life left behind in the mountains, from where I came to study the iron sesquioxide and the sodium bicarbonate in those cold rooms of Graça convent!"

Camillo was reporting to events that took place in 1845, most probably to chemistry lectures given in a conventional room, as a chemistry laboratory was practically non-existent in those days, though the 1837 reform act had ruled its creation. The Graça Convent was (and had been for decades) the site of the Royal College of Orphan Boys, shared from the beginning of the nineteenth century with the Royal Academy of Navigation and Commerce. The premises stood as a block of houses with different ages, packed together and filling an irregular pentagon-shaped area, surrounded by the outer walls of this earlier academy, whose construction was frequently hindered on the grounds of insufficient funding. Until the end of the century, this would be the overall appearance of the Polytechnic Academy.

The first chemistry laboratory came into existence by 1844: It was a 9.2m long, 2.5m wide corridor adjoining the chemistry class, deprived of apparatus and utensils, simple and compound substances, as reported by Manoel Nepomuceno, former student and preparer at the academy between 1859 and 1877 (FERREIRA DA SILVA 1893). According to his account, the laboratory had little more than some melting ovens, with air admitted by big blacksmith's bellows; a few glass flasks and retorts; some tin plate alembics; one pneumatic trough; one large wooden mortar, a few others in bronze, iron and marble; and some jars containing substances. José António de Aguiar (1812–1850), appointed substitute chemistry lecturer in 1839, often paid for reagents and glassware to perform demonstrations, out of his own pocket.

In 1852, an Industrial School was created and lodged in the same unfinished building. The common usage of the chemistry laboratory (as well as of the physics cabinet), decreed not long after the foundation of this school, would contribute, though not immediately, to the improvement of the laboratory's conditions. By 1864, the same year the Industrial School was turned into the Industrial Institute of Porto (nowadays the Instituto Superior de Engenharia), the chemistry laboratory was reportedly (ABREU 1865) an irregularly shaped room at the first floor, whose location has not yet been identified; merely 4.3m high, with wooden floor and plaster ceiling, it was completely inadequate for either industrial chemistry preparations or delicate experiments and analyses. The chemical manipulations were thus limited to the repeated extraction of some gases and preparation of some alloys.

The role of Ferreira da Silva

A breakthrough took place in 1868, when an area in the eastern wing, at ground level, previously occupied by shops whose profit was intended to support the orphans, was transformed into two adjoining laboratories, for the Polytechnic Academy and the Industrial Institute, to a certain extent following the installation model described by Bobierre (BOBIERRE 1844; FERREIRA DA SILVA 1893).

A character then came into scene, who would decisively shape chemistry in Portugal, and particularly in Porto, in the last quarter of the 19th century, and through the first decades of the 20th century: António Joaquim Ferreira da Silva (seen in the photograph at fig. 1 as a young man among his peers).

Born in 1853, Ferreira da Silva graduated in the University of Coimbra and was appointed substitute lecturer for the Natural Philosophy Section at the Polytechnic Academy when he was 24. He would teach chemistry all his life, in the academy and later in the faculties of science, pharmacy and medicine of the University of Porto.

Shortly after his admittance, he initiated a systematic program – extending for years, as reported by successive academy's yearbooks – of acquisition of apparatus and instruments, utensils, reagents, and mineral and organic samples, while gradually altering the laboratory's furniture and appliances.

He also set up the Laboratório Municipal de Química do Porto in 1884, supported by the Town Hall and inspired on the Laboratoire Municipal de Chimie de Paris, to control public hygiene conditions and



Fig. 1 - Some of the Polytechnic Academy's lecturers in the academic year of 1880–81: Ferreira da Silva is the young man standing on the right. Photo: Courtesy of the Chemistry Department of the Faculty of Science

biochemistry in Portugal, and José Pereira Salgado, who would become rector of the University of Porto, Ferreira da Silva created, in 1905, *the Revista de Chimica Pura e Applicada (Journal of Pure and Applied Chemistry)*. He also co-founded the Portuguese Chemistry Society (1911).

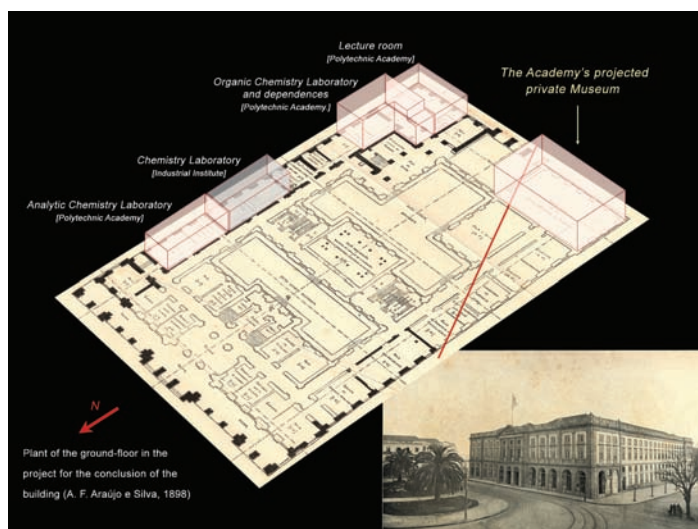


Fig. 2 - Areas occupied by the chemistry laboratory at the turn of the 19th century, along the eastern wing of the academy's building. Inset is an image of the building, after completion. Photo: *Anuário da Faculdade de Ciências, 1911–12 a 1913–14*

Birth and life of a laboratory

According to this project, the 22m long, 11m wide room at the Southwestern corner – formed as the building's implantation area changed from a pentagon to a rectangle – was to accommodate the academy's private museum (ARAÚJO E SILVA 1898), for the display of models representing remarkable national inventions, either as a project or that had actually gone into operation. However, at some stage, a choice was made to turn it into a new analytic chemistry laboratory, taking advantage of its more than 6m height.

prevent food fraud. It would be enlarged in 1889, and a photometry office would be added, to watch over the quality of lighting gas. Well equipped and in possession of an exceptional library, the laboratory became a truly practical school of chemistry for those working in it. This facility was closed down in 1916, despite the accusations of funding misuse moved against Ferreira da Silva were dropped, following a 10-year judicial process.

Together with his closest collaborators, Alberto d'Aguiar, who himself directed a successful private laboratory and is considered a pioneer of research in

Ferreira da Silva was a tireless and methodical worker, who built an international reputation in analytical chemistry and toxicology, contributing writings on these subjects and also on pedagogy, ethics and religion, as well as chemistry textbooks.

The areas of the academy that were already occupied by the chemistry laboratory in the late 1890s, as a direct consequence of Ferreira da Silva's research and teaching achievements, can be seen in fig. 2; the plant shown relates to a project dating from 1898, intended to complete the building (the straight line indicates where the façades of the earlier constructions had been).



Fig. 3 - View of the large fume cupboard, c. 1920. Photo: Domingos Pinto, Photographia Ideal, Porto (Archive of the Museum of Science)

The delivery note of the tabletops for the work benches, kept in the Museum of Science's document holdings, helps to establish when the decision may have been taken: these tabletops, made of enamel lava stone from Volvic (a chemically very inert material), were shipped from Paris in the last day of 1912. The laboratory's grandeur, somehow conveyed by its impressive height, can be appreciated in this view of the large fume cupboard against the eastern wall, still existing today (fig. 3).

In December 1922, the analytic chemistry laboratory was renamed after Ferreira da Silva, as a tribute to the chemist. He was unable to attend the

ceremony, as his wife had died a few days before. He himself would die a few months later. The homage further comprised the unveiling of a bust by the renowned Portuguese sculptor Teixeira Lopes, and the renaming of the street running along the building of the Faculty of Science (which replaced the Polytechnic Academy in 1911, with the foundation of the University of Porto).

José Pereira Salgado (1873–1946), who had been one of Ferreira da Silva's closest collaborators, took over the direction of the chemistry laboratory. The ongoing struggle for space would lead to the refurbishment of the now 'Ferreira da Silva' Laboratory, in order to accommodate classes of qualitative and quantitative chemical analysis: in 1927, a mezzanine was built all around, with a wrought-iron balcony (fig. 4). A double staircase connected the two laboratories thus formed. Divisions made with glass panes, some of them colored green, created reserved areas, for an office, and for small cabinets designed for the storage of glass utensils and operation of analytic balances.



Fig. 4 - The 'Ferreira da Silva' Laboratory c. 1930: eastward and westward views. Photo: Photographia Ideal, Porto (Archive of the Museum of Science)

In the 1940s, again out of lack of space, the mezzanine was demolished, and the ceiling was lowered in order to have rooms added at the intermediate level thus created. The laboratory was used until 1996, when the present departments of physics and chemistry moved to new facilities. It was then

entrusted to the newly founded Museum of Science, and is now the museum's main storage room, regrettably not accessible to visitors.

The 'Ferreira da Silva' Laboratory: What next?

Attention has been drawn already to the fact that Portugal seems to be a privileged country in the European scenery, as far as historical laboratories are concerned. As Lourenço & Carneiro have stated (2006, 63),

“though they have been naturally degraded by usage, and suffered modifications through time, three examples of chemistry laboratories can be found in our country, one from the 18th century (in Coimbra), one from the 19th century (in Lisbon, being quite large and having survived almost intact), and one from the early 20th century (the Laboratory 'Ferreira da Silva' in Porto, presently integrating the Museum of Science of the Faculty of Science)”.

This circumstance has been considered, by these authors, “to be an unique opportunity for interpreting and communicating almost the whole of Chemistry, as well as an invaluable source for research” (LOURENÇO & CARNEIRO 2006, 64).

The Museum of Science has, from its very start, endeavored to preserve the 'Ferreira da Silva' Laboratory, and plans to have it restored to the period of its most appreciated architecture, between 1927 and 1949. We have sufficient information – in scattered pieces of furniture that have been found and sizeable photographs held by the Museum – to allow for the faithful reconstruction of the laboratory, as it was in the nineteen thirties and forties. None of the original fittings, such as the large work benches and fume cupboards, has been destroyed in the past interventions, thus, the aspiration to restore the laboratory's Art Déco style merely adds aesthetical value and does not downgrade its scientific functionality.

The collection of chemistry instruments is still poorly studied, at this stage. It can be said, however, that it is the result of the systematic purchasing of instruments, reagents, utensils, etc., by Ferreira da Silva, for over 20 years; the addition of the holdings of the Laboratorio Municipal, after its closure, in 1916; and, finally, the elimination of many instruments bought before 1940, in the 1960s. Dramatic as this may sound, it is still a significant collection. The collection of physics instruments held by the Museum of Science, having not been subject to this cleansing action, is much larger. Both collections await adequate conditions to be put on exhibit.

Conclusion

The 'Ferreira da Silva' Laboratory is, recognizably, a unique example of an early 20th century teaching chemistry laboratory to be found in Portugal, its original fittings remaining relatively untouched, though having been used by generations of students and twice subject to major architectural modifications. As far as cultural/scientific tourism is concerned, its restoration would provide an opportunity – for national and international visitors – to come into touch with historical laboratories from the three oldest universities in the country, built at different times in the timeline of chemical teaching and research, and framed by the characteristic conditions of each institution. Furthermore, being Portugal such a small country, these laboratories happen to be confined to a 300-kilometer distance tour. This sort of experience may no longer be possible in some countries where the urge for intellectual and technological production, combined with resource and space management, led to the irreversible alteration or utter disappearance of laboratorial infrastructures considered obsolete.

The building housing the 'Ferreira da Silva' Laboratory belongs, historically, to the Faculty of Science, whose departments have gradually moved out, between 1996 and 2008, as the university grew larger. The decision was then taken to hand over this building, the most significant one in the history of the

university, to the rectory, to be shared with the National History and Science Museums, both created in 1996, and with the university's archives and ancient holdings library. Over the past years, the memory of laboratories and theatre rooms alike has been erased, as these interiors have been refurbished in accordance with its newer bureaucratic functions. As it is, the laboratory's fittings are the only indoor infrastructures left, which are reminiscent of the early days of the Faculty of Science.

Moreover, as we tried to show through the history unfolded above, the decision for setting up this laboratory in a significant part of the building of the Polytechnic Academy, when it was finally completed after a delay of several decades, emerged as a consequence of the research and teaching activities in chemistry which were then held in Porto, by the hand of the distinguished chemist Ferreira da Silva. Chemistry was considered to be cutting-edge science at the turn of the nineteenth century, while Ferreira da Silva was one of our most respected scientists at the time, as well as a competent teacher, which necessarily ought to be valued by any university.

The character of Ferreira da Silva is also evocative of the relationship between the university and the community. His field of expertise – analytic chemistry and toxicology – had direct application in common people's prized goods such as health and hygiene. The creation of a chemistry laboratory in a town with severe hygiene conditions by the end of the 19th century, to watch over the quality of food, water and lighting gas, is an example of civic awareness – still relevant today – given by both Ferreira da Silva and contemporary City Hall authorities. The Laboratório Municipal de Química no longer exists: it lives, however, through objects still existing in the chemistry instrument collection, and through a laboratory that came to light in the wake of the recognition of the importance of analytic chemistry in citizens' lives, and consequently, in the background the university was expected to provide to prospective chemists.

Last but not least, it is intended that selected items from the chemistry and physics instrument collections integrate a permanent exhibition in dedicated space, picked out from the areas already assigned to the Museum of Science. If the University of Porto is fortunate enough to have a chemistry laboratory with its earliest fittings still present, we believe that the scenario for this permanent display should be a historically and scientifically meaningful space such as the 'Ferreira da Silva' Laboratory, as opposed to any general-purpose, uncharacteristic space. The intrinsic value of this laboratory, though seemingly centered on the life and deeds of one person, yet, under a more attentive eye, deriving from the ability to offer multiple interpretations, then adds to the value of the collection.

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Past and current identity of the Zoology Museum of Ghent University

DOMINICK VERSCHELDE & DOMINIQUE ADRIAENS

Abstract

This paper investigates the history and aim of the Ghent University Zoology Museum on a whole, and looks at the achievements of its more interesting directors and curators in specific. In 1817 Ghent University purchased a natural history collection in order to illustrate the lectures. Anatomy and zoology were taught in sciences and medicine by people of importance to the university, and the Flemish community. The paper stresses on the specific views of the directors, e.g. Professor F. Plateau was convinced that anatomy was best studied by dissecting animals yourself. Very important to the University, Flemish community and the city of Ghent, McLeod introduced Dutch as the teaching language. This didactic collection struggled between the Great War and World War II, but from the late 1990s evolved into a museum on demand, introducing science communication within and outside the university, and eventually growing into a workshop centre promoting the scientific method and critical reasoning.

Introduction

Taking care of any kind of collection requires a special kind of passionate people. In 2017 the Ghent University and the Zoology Museum will celebrate their bicentennial anniversary. So in almost 200 years we had quite a few colorful people caring for the collections. Colorful and important not only for the Zoology Museum, but also for education at Ghent University, and even for the Flemish community. This article gives tribute to those people.

From the early years on: A pure didactical collection

Ghent University was founded in 1817. At the first annual meeting of the founding professors, the professor of zoology reported the acquisition of a natural history collection. This was done because of a Dutch law of 1816 (the 'Zuidelijke Nederlanden' that became 'België' on October 4th of 1830) stated that every academic institution should start collections in order to be able to illustrate the 'ex cathedra' classes. Collections of anatomy and zoology were established. Article 129 of the *Règlement sur l'organisation de l'enseignement supérieur dans les provinces méridionales du royaume des Pays-Bas* of September 25 of 1816 states: "Pour l'enseignement de l'histoire naturelle et spécialement de la zoologie, il y aura dans chaque université un cabinet pour l'histoire naturelle des animaux et pour leur anatomie comparée".

Up to the 1870s such collections were the focal point for class instruction. Research laboratories only started to appear from the 1870s onwards. 'Biology' as such didn't yet exist. Among others, anatomy and zoology were given as subjects of study for obtaining a PhD in sciences, or to pursue a degree in medicine. That was still the case at the turn of the 19th to 20th century.

The first professor responsible for zoology, comparative anatomy, as well as botany, was F. P. Cassel (1784–1821). Cassel bought part of the collection of C. J. Temminck. Though we cannot prove this, it is likely that our Tasmanian Tiger (*Thylacinus cynocephalus*) came with that purchase. Although the collections started in 1817, at that time no entry logs were kept. These were only started in 1853. Our Thylacine is mentioned in a systematic log dating from 1906, but is not mentioned in the entry logs between 1853 and 1906, implying that it was acquired before 1853.¹

¹ Anonym, unpublished hand written entry catalogues of the Zoology Museum, 1853–present.

Cassel's successor was F. J. Cantraine. Professor Cantraine purchased part of the famous fish collection of Risso in 1844 (HASPELAGH 1992). Unfortunately this collection, as well as other specimens, vanished during the German occupation.

After this period comparative anatomy and zoology was taught by two different professors. Charles Poelman held the chair of comparative anatomy, while Richard Boddaert was responsible for zoology. Professor Charles A. C. Poelman (1815–1874) contributed mainly by dissecting and preserving many anatomical specimens himself. When he arrived, the comparative anatomy collection was quite small, and mainly consisted of skeletons. Poelman knocked on every door, and contacted anyone who could provide him with cadavers. He built up a collection with many organ- and muscle-specimens, aside from the skeletons, the collection may currently be the largest in Belgium. He would be a great example for his successor Félix Plateau. From 1853 onwards many dead animals arrived from the newly established Ghent zoo. The collection grew so much that in 1868 he published a catalogue of comparative anatomy (POELMAN 1868); the only printed/published catalogue the collection has. In this catalogue we find an interesting feature: on page eight he mentioned a collection of 270 human skulls of “decapitated men and criminals who died at the Ghent prison”. He furthermore commented that these skulls bear special features: they had pronounced eye brow ridges and heavy, protruding jaws. In fact, this early phrenology leads him to describe murderers as being Neanderthals.

Before speaking of Félix Plateau we need to address his father Joseph Plateau. Joseph Antoine Ferdinand Plateau was born in Brussels on October 14, 1801. He graduated as a candidate in physics and mathematics in 1824. For his PhD study he worked on the (after) effects and impression made by light on the retina of the eye. He became a professor at Ghent University in 1835, after being introduced by his mentor, Lambert Adolphe Jacques Quetelet. He was such a tenacious experimenter that at one time he looked directly into the sun for 25 seconds, which supposedly was the reason why he became blind in 1844. Through his studies of the light impressions on the retina, he stumbled on the aftereffect these impressions have on the eye (e.g. why do we see raindrops falling as lines and not as separate droplets?). He worked out optical illusions and proved that with light impressions on the retina the illusion of smooth movement can be obtained: we observe a moving image instead of a series of still pictures. To demonstrate this, he designed his phenakistiscope. Joseph Plateau truly is the father of cinema/cinematography.

The university archives try to collect as many hand-written text books of their former professors. Professors dictated and from time to time wrote down their classes on the blackboard, in order to enable their students to write down their own text book. Among others, the university was able to collect copies of Félix's as well as of Joseph's classes. In Joseph's class book we can read a curious entry: it seems that when Joseph was teaching about vacuums, and thus mentioned the experiment with “les boules de Magdeburg”, he didn't write this on the blackboard as the student, who definitely hadn't understood his professor very well, wrote the following in his text book: “les boules de Marc De Boer” (meaning ‘the balls of Marc the farmer’).

Prof. Dr Félix Plateau, the son of the father of cinema, was convinced that morphology and especially anatomy should not be studied from a book, but by dissecting the actual specimens yourself, only using books to guide you as a recipe book does whilst cooking (fig. 1; specimen drawn ‘d'après nature’ in Plateau's *Zoologie élémentère* (1884), restoration D. Verschelde).

Félix Auguste Joseph Plateau (1841–1911), son of physicist Joseph Antoine Ferdinand Plateau and Augustine Thérèse Aimée Fanny Clavareau, was born in Ghent on June 16, 1841. He grew up in a family atmosphere focused on the arts and sciences. From an early age, he collected and studied plants and animals. His father gave him a separate room in the house which he could organize as his own small museum. He collected insects, kept amphibians and reptiles in spirits, and stuffed birds and



Fig. 1 - Restored skeleton of a frog. Photo: D. Verschelde. Specimen drawn 'd'après nature' in Plateau's *Zoologie élémentaire* (1884). Restoration: D. Verschelde. Photo: D. Verschelde

small mammals. Apart from this he had a talent for drawing and painting, painting many places he visited. This talent proved to be of interest during his later studies.

After getting his PhD degree on April 18, 1866, he went to Paris to obtain an extra PhD degree (thesis on parthenogenesis in 1868). Witnesses of this come from a self portrait, and from a drawing of 'Gina', a gorilla in Paris's Natural History Museum. Félix Plateau wanted to be a professor at Ghent university, and for this end he had talked with C. F. Thiery, director of the Department of Education. It was Thiery who recommended that

Felix get a second PhD degree, in order to enhance his chances.

Félix taught in Bruges for two years where he organized excursions, already showing his conviction that nature and science are to be studied hands on.

Musical chairs: It seems that whenever a professor retired, the other established professors could choose what subject they wanted to take and teach, leaving the 'left-over's' for the new guy who had yet to be appointed. During the academic year of 1869–1870 professor Poelman of Ghent University asked to be relieved of his course on comparative anatomy, because of health reasons. It was to be given temporarily by M. Ch. Van Bambeke. But by the end of that same year Prof. Poelman had to retire. His 'chair' of 'Physiology' was now to be given to Prof. Richard Boddaert, who himself vacated the chair of Zoology.

The government combined the two vacant classes and put them under one chair. Soon after father Joseph wrote to Thiery to remind him of the fact that his son thought himself to be fully qualified. Félix Plateau got the job. He now cared for the museum as we know it today, containing the combined collections of comparative anatomy and of zoology.²

From the very beginning, Professor Félix Plateau was convinced of the importance of anatomy in zoology and of the hands-on approach. He elaborated on this in the introduction of his book *Zoologie élémentaire*, published in 1884: "It is necessary, if one wants to become a zoologist, to study the animals with the aid of a scalpel and microscope, this in order to witness oneself how the remarkable structures and organs work." He emphasizes that zoology in all its facets (anatomy, physiology, histology, embryology etc.) can only be studied by scientific observation. According to Plateau, books only serve as a reminder and a guideline. His conviction can be recognized in the comparative anatomy collection that contains many muscle, pulmonary, heart, and other anatomical specimens made by him.

He stresses that anatomical studies supports morphological and systematic research. Through the entire collection, there are cross sections showing the internal structures of animals, and disarticulated exoskeletons of arthropods. It is worth remembering that when he started teaching, the collections

² P. VANHOUTE, unpublished hand written text book of the classes of Professor Félix Plateau, 1890; in ownership of D. Verschelde.

were still the focal point of university; they were studied and fully used in the education of students. Research laboratories only emerged around 1870.

Félix Plateau also was a family man. He made comical drawings of the adventures of cats for his grandchildren. The cats go to school, do stuff around the house, go shopping, and visit different places. The cats in reality represent the Plateau family and what they were doing in real life.

At a later stage in his career he made a huge number of smaller diorama's illustrating mimicry and camouflage. He published 120 articles on arthropods, mollusks, and on the anatomy of the African elephant (*Loxodonta africana*).

Victor Willem – his pupil, later 'préparateur' (a position somewhat like a curator) and 'chef de travaux' (work leader), and finally his successor – writes that under the wings of professor Félix Plateau about 28,000 specimens were added to the collection (WILLEM 1913).

After a career of 38 years Plateau retired in November of 1909. He died on March 4, 1911.

Dr Julius McLeod was born in Ostend on February 19, 1857. At first, in high school he studied literature, but later gained a PhD in sciences (zoology). The government sent him on numerous scientific trips (Holland, Germany, France, Algeria etc.), trips concerning zoology as well as botany. Eventually he taught at the Faculty of Medicine at the university. In this period he also was 'préparateur' in the Museum. He also was asked/ordered by the university governors to teach at the 'Normaalschool voor de wetenschappen' (training schools for teachers, in his case in sciences), connected to Ghent University. At that time (1888) he was the first to teach botany in Flemish (all higher studies were done in French). Eventually he taught zoology, botany, and ethnography in these high schools, all were delivered in Dutch (Flemish). From this time onwards, most of his articles were no longer written in French but in Flemish. He also wrote articles on *Dutch and Science*, and about Ghent High schools turning to Dutch as the teaching language. He was the first to publish a Flemish (Dutch) illustrated flora (MCLEOD & STAES 1892), as he was a strong believer that Dutch should be the primary language used at Ghent University. Julius McLeod laid the foundation for us to have a Dutch (Flemish) speaking university in Ghent. Hand written text books of the classes of Prof. Van Rampen³ and of Professor Sluiter dating from 1914 and 1915 are already in Dutch.⁴ So, if it hadn't been for Julius McLeod, we would have been educated in French.

Prof. Victor Willem (1866–1952), Plateau's successor, was responsible for collecting many marine samples and specimens from marine stations such as Napels, Roscoff, Banyuls, and Wimereux. He also published several papers on respiratory organs in fishes; some were published the year before he died (WILLEM 1951a+1951b).

In 1967 Prof. De Coninck (1909–1988) sent a very promising scientist by the name of August Coomans to the Great Barrier Reef. Coomans collected many marine specimens, mostly comprising invertebrates. This expedition was the last of its kind that considerably augmented the museum's collections. Prof. August Coomans was our previous director of the Zoology Museum (till September 30, 2001).

Nowadays two, somewhat idiosyncratic, yet passionate, people take care of the Zoology Museum. Dominick Verschelde was the first curator in a Flemish university in modern times (since 1997). In 2002 he was joined by a new director, Prof. Dr Dominique Adriaens. Dominick Verschelde is the conservator-curator-scientist-guide, but also still answers to the historic name of 'préparateur'. To give

³ M. Lau, *Anatomie der ongewervelde dieren*, unpublished hand written text book of the classes of Prof. W. Van Rampen, 1914.

⁴ M. Lau, *Vergelijkende anatomie I*, unpublished hand written text book of the classes of Professor Sluiter, 1914, 1915; M. LAU, *Vergelijkende anatomie II*, unpublished hand written text book of the classes of Professor Sluiter, 1915.

one example, on May 23, 2001, he dissected a newly acquired elephant cadaver (fig. 2). He worked on the elephant for five consecutive days after which the skeleton was chemically cleaned, and mounted two years later by him. Both Dominick Vershelde and Professor Adriaens are very dedicated to the task of spreading scientific method and critical reasoning into the community.



Fig. 2 - Skeleton of the Asian elephant 'Chamba'. Photo: D. Vershelde

The people – Science connection

In the early days, the collection was an elaborate didactical one. From the Great War until after the Second World War it experienced many difficulties and was ignored for years. During the occupation many specimens were either taken by the Germans (collection of Risso, type material of insects and of dolphins, skeletons of whales, and a collection of deep-sea fish) or were destroyed. During the interbellum most of the dioramas of Félix Plateau, together with a range of stuffed animals from Ghent Zoo were given to start up the 'school museum' in Ghent. Bad management and WW II meant specimens were either stolen or eventually incinerated in the 1960s. Elderly citizens of Ghent testify that during the 1930s the 'schoolmuseum' was not used or exploited, but neither were the doors locked. So with the doors open, people could just enter and take what they wanted. During WW II a bomb demolished the roof, leaving the stuffed animals open to the elements. Even though they were covered beetle infestation followed. So, after the war, what hadn't been stolen, had been eaten. When, in the 1960s, they wanted to move the museum to another location, the natural history collection was too damaged to move. Everything was left on the street, and what people didn't take, was finally burnt.

So, after a few difficult decades, we gradually picked up the pieces, and from the late 1990s we evolved towards a museum in demand, passionately struggling to introduce science communication within and outside of the university, and eventually growing into a hands-on workshop centre promoting the scientific method and critical reasoning.

From 1997 the objective of the museum changed. The university students are still our primary public, we provide lessons, practical courses, and support for research in the context of bachelor dissertations. Now we also reach out to the general public. This started with topical exhibitions and guided tours, and expanded into organizing workshops for all groups and ages. As they are the



Fig. 3 - Students working on a bachelor dissertations subject. Photo: D. Verschelde



Fig. 4 - Swifts by their nest. Photo: D. Verschelde. Though 'Belgium' was no longer under Dutch rule by that time, it seems that the Ghent University still held good contacts with the Dutch prince.

scientists of the future, we gladly focus our efforts towards young children. A few of our most successful workshops are: *Pond-critter*, *Animals and their sex*, *See, hear, feel, taste ... to believe or to know*. The latter is an extensive workshop in which we convey the importance of the scientific method and associated critical reasoning.

For our primary public, we organize research topics for two types of bachelor dissertation: one concerning science communication towards the general public, where the student needs to write and work out a topical exhibition; the other is more research focused as students compare and study skeletons of different but related vertebrates with the aid of statistical analysis tools (fig. 3).

To attract more than nature enthusiasts to our exhibitions, we present our natural history specimens not only from a biological point of view, but also try to include possible historical data and cultural contexts of certain specimens. To give a few examples: we have specimens gifted by F. Plateau, which very likely first landed on the dinner table when he was a young boy at his father's house before he cleaned and mounted the skeleton (e.g. *Pleuronectes platessa*); we have the cervical vertebrae of 'Betsie', the most famous and sung about elephant from the Ghent Zoo (1887);⁵ we have a mounted diorama from Java of swifts on their saliva nest, which was brought back in 1838 by Prince Hendrik van Oranje (fig. 4; though 'Belgium' was no longer under Dutch rule by that time, it seems that Ghent University still had good contacts with the Dutch prince).

⁵ Text and translation on demand with the first author.

In short

As most museum personnel are, we are neither pure laymen nor are we strict research scientists, but we are both and we act as in-betweens. We don't endeavor doing research for the sake of research, but to act as the glue that links research to scientific outreach, to disseminate it and share it with our colleagues and the entire general community.

The Zoology Museum plays a role in the preservation of specimens for future generations and the provision of hands-on education to students at secondary, high school and university levels. It also cares for specimens important to the cultural history of the city of Ghent.

New directions

Since 2010 five of our university collections have been meeting and working towards a new collective aim, mission and strategy. They are the ethnographic collection, the archeological collection, the Museum for the History of Sciences, the Morphology Museum (Faculty of Veterinary) and the Zoology Museum. For the moment we are fine tuning our efforts and aims; we are working towards an uniform database, and are organizing themed exhibitions. In short we are working towards an integrated and complementary, uniform Ghent University Museum in which all collections of our alma mater will reside and made accessible to the general public.

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For the public, with the public, by the public: George Wilson and the Edinburgh Industrial University Museum

KLAUS STAUBERMANN

Abstract

University museums have played a significant role in the development of science and engineering knowledge for a long time. The first professorship of technology at Edinburgh University was synonymous with the position of curator of the university's newly founded Industrial Museum. The unique approach of George Wilson, who held the first technology professorship at Edinburgh University in the 1850s, was to perceive the museum as an active mediator in the understanding of materials, techniques and processes. Artifacts for him were instrumental in the transmission of contemporary knowledge. Interaction with audiences in return enabled museum curators to build both collections and expertise. The examination of these historic practices today helps us to expand our own understanding of public engagement in museums.

For the public

The focus of this paper will be on artifacts. The role of artifacts in the making of technical knowledge has received growing attention over the past few decades. Artifacts have been studied both in the context of museum collections and increasingly in the context of their disciplines or broader cultural contexts. Artifacts are an expression of cultural practices but they also transform cultural practices. In education, the many uses of artifacts can range from simple representations to complex research tools. Artifacts can also change their use over time, for example from teaching tool to decorative item. This paper looks at specific types of artifacts in the museum context and how the uses and perceptions of these artifacts have changed over time.¹

The idea to display and illustrate artifacts and processes of manufacture at a Scottish Industrial Museum dates back to Edinburgh University's first professor of technology and museum director, George Wilson. Wilson had intended to educate the public in crafts such as glass-making, gun powder-making or candle-making. His background was in chemistry but he wanted to present and interpret all branches of technology in his museum. Wilson had been a lecturer before his appointment as professor of technology and had aimed taught students – academic and non-academic – of both genders, as well as working people.²

In his inaugural lecture Wilson outlined:

“An Industrial Museum is intended to be the repository for all objects of useful art, including the raw materials with which each article deals, the finished products into which it converts them, drawings and diagrams explanatory of the process through which it puts these materials, models or examples of the machinery with which it prepares and fashions them, and the tools which specially belong to development and analogies, and the social context of production and use.” (WILSON 1855)

Unfortunately, Wilson died in 1859, four years after he was appointed and had delivered his outline of a new industrial museum for Scotland. However, many of Wilson's ideas, such as a public laboratory and workshop were realized.³ The first steps towards educational displays in this university museum

¹ See, for example, DE CHADAREVIAN & HOPWOOD 2004, or SCHAFFER 1994.

² SWINNEY, G. 2008. *Placing and materialising industry and technology – George Wilson (1812–1859) and the establishment of new spaces of intellectual endeavour*. National Museums Scotland Research Repository.

³ Such developments were of course not limited to Edinburgh and should be seen in the broader context of creating teaching apparatus at educational institutions in the 19th century. There is a broader political narrative to be told, which I want to skip here, about the creation of science and industry museums in Britain during the 19th century, the significance of the Parliament's

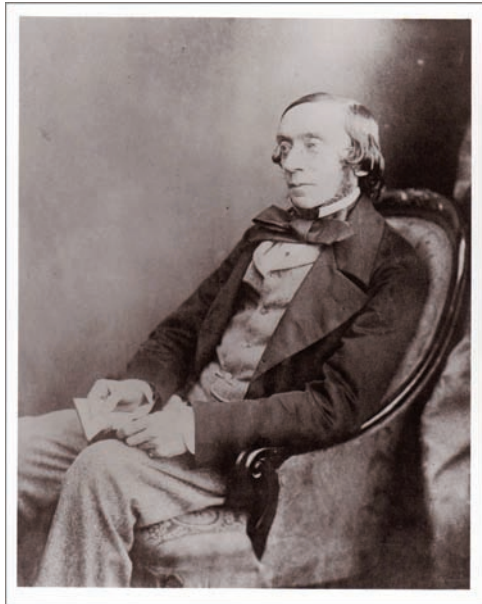


Fig. 1 - George Wilson, the first director of Edinburgh University's Industrial Museum © Trustees of National Museums Scotland

had been modest. The museum's first annual reports give us an insight into the development of both early engineering model making and the model-making workshop. The report of 1858, for example, published shortly after the opening of the museum, lists working models and machines as part of a small exhibition on manufacturing. Models as well as original artifacts at that time were either donated to the Museum or purchased. These were models of furnaces, steam engines as well as models of tools and manufactured products.

These models were not limited to Scottish manufacture and included, for example, a Chinese loom and a rice mill. Scottish companies and firms were in support of the new museum and donated models or sold them at a reasonable rate. However, ten years later the museum had already furnished its own model-making workshop and had its first model-maker. The museum's annual report of that time states that the museum's first curator and accountant Mr. Galletly, besides his various other

duties, had superintended the making of an impressive series of models. The models produced in the museum workshop were intended to represent the latest technical innovations. The museum's annual report of 1868 states:

"In the Industrial Department a very interesting and valuable series of models of some of the most useful machines, such as the steam hammer, steam winch, hydraulic ram, metallurgical apparatus etc. have been made under the direction of Mr. Galletly, who is specially qualified for the work; and these have been found of great value to students of engineering" (ROYAL SCOTTISH MUSEUM 1868, 5).



Fig. 2 - The Royal Museum's Technology Workshop where large numbers of engineering models were produced © Trustees of National Museums Scotland

Models became not only more complex, they also became bigger. The Industrial Museum's workshop exercised its newly acquired skills on a model of a 50 ton steam crane, a turbine section, a Corliss-engine, a zinc smelting furnace and a Siemens regenerative gas furnace. Reasons for commissioning or building a model could vary: sometimes it would be made because of an invention that caused public attention, like the hydro-pneumatic gun carriage put into service in 1888 and built as a museum model in 1891 or the Temple opening bridge in Glasgow, opened in 1931 and built as a model in the 1930s, although not completed till after the Second

Museum and Library Act of 1850, the importance of the Great Exhibition of 1851, and growing British concerns about international competition during this time. The foundation of the Industrial Museum at Edinburgh University must be seen in this context. See e.g. An Act for enabling Town Councils to establish Public Libraries and Museums, August 14, 1850. Parliamentary Archives, Houses of Parliament, London.

World War. Sometimes a model could be built for an exhibition or because it formed part of the university or college teaching curriculum.⁴



Fig. 3 - The Royal Museum's engineering galleries as they would have appeared for most of the 20th century © Trustees of National Museums Scotland

Alexander Hutchieson, Keeper of the Department of Technology at the time of the Royal Museum's 100th anniversary, summarized:

"Before his death, George Wilson had made provision for a technological workshop, which was formally instituted in the year 1866 for the purpose of making instructional models and specimens for display in the industrial sections. This has proved a most valuable asset of increasing importance throughout the history of technology in the Museum. Freed from the harassing effects of commercial production, successive teams of highly skilled craftsmen have over the years not only furnished useful re-creations of the more important developments in the history of technology, which could have been provided in no other way, but they have built up a school of model-making which has become a museum tradition" (ALLAN 1954, 42–43).

A visitor to the museum in the late nineteenth or early twentieth century would have found a museum with a display of perhaps several hundred engineering models, with original machines in between and framed by impressive ship models. With the introduction of electricity many models had been designed as push-button models, rendering movements and processes more visible. However, for a museum visitor in the second half of the twentieth century the picture looked very different: only very occasionally a scale model would be built and by the end of the 1970s the Royal Museum's model-workshop was finally closed (WOOD 2000).⁵

Changing experiences

How can this decline of educational models and model making in museum be explained? Did artifacts become too complex to be displayed through models? Or did the model loose out again another ways of educational display? The factor that probably most affected the role of models in the museum is the development of the science center movement. From the 1930s onwards first scholars and then museum increasingly promoted the role of authentic experiences and interaction in education. The first museums to employ this new approach were open-air museums. However, soon this new approach spread to science and in 1937 the Palais de la Découverte in Paris, the first modern science museum, was opened. The post-war period of the 1950s and 1960s marked a period of experimentation for exhibition designers and as one result in 1969 the first science center was founded, the Exploratorium in San Francisco (KONHÄUSER 2004). Scientific phenomena could be imbedded in an interactive so that every visitor could share the same experience. These experiences were thought to be more interesting and stimulating than simply watching a model.

However, this new demand for action and practice did not remain unnoticed by model makers. Although models did not furnish the visitor with a practical experience, practice could be displayed

⁴ Movie: HARPER A. ca. 1938. *Royal Scottish Museum*. Edinburgh: National Museums Scotland, 069 (411) Edi. RSM/E.

⁵ WOOD 2000, 79. This can be seen as part of a wider trend of model-making workshop closures in the 1970s. See, for example, ANDRÉ & DIGEON 2006.

through models to a certain extent. Model-makers responded by building even more authentic models. They increased attention to detail, thereby making the model appear more realistic. Sophisticated section models enabled the visitor to explore the inner life of a machine. Larger than life models helped to understand details and working models of course could help to understanding the functioning of a device. Often, a model-maker would add a scale worker or machinist to the model to demonstrate how a machine would be manipulated. Often these engineering-models would be accompanied by texts, diagrams and even dioramas. And last but not least, models could be demonstrated by museum-guides, thereby animate both subject and machine.



Fig. 4 - The museum's current engineering displays include a restored and partly working eighteenth century Boulton and Watt engine © Trustees of National Museums Scotland



Fig. 5 - A restored and working early twentieth century traction engine which is used as part of the museum's outreach events © Trustees of National Museums Scotland

There is a fundamental difference to be made between animated models and interactives: whereas a model demonstrates the working of a machine, an interactive enables the visitor to actively experience a device. No matter how authentic the model looks and how well the practice that was needed to make it work was demonstrated, the visitor experience still remained largely passive.⁶



Fig. 6 - A model bridge building workshop at the museum, based on original bridge designs and aimed at families © Trustees of National Museums Scotland

On the other hand, an interactive is hardly able to give a visitor the complex experience a machine operator or user would have lived through. Moreover, the design features of a machine that could be demonstrated by a well-crafted model would be reduced to its basic principles by an interactive. It is worthwhile to look how museums respond to this challenge today.⁷ Science centers move increasingly away from the demonstration of phenomena and towards the demonstration of processes, often portrayed through history. They draw on

⁶ On the idea of experiential learning see, for example MATON-HOWARTH 1990.

⁷ The question what knowledge exactly is transferred by means of a three dimensional model has been raised by the philosopher James Griesemer (GRIESEMER 2004).

the experience that visitors enjoy historic artifact experiences, such as object handling sessions or curator's choice talks. The boundary between science centers and museums blurs and science centers increasingly employ historic artifacts to demonstrate that science and technology have a past and are not created at the push of a button. History also helps to understand that progress can be as much about failure as about success. Moreover, looking at social and cultural contexts has become increasingly important for the understanding of science and technology.

Museums today

How does this affect the role of science and technology museums today? One approach that has proved very useful in the public understanding of science and technology over the past years is the re-enactment of historic practices. This can mean the rebuilding of historic apparatus, the practice with replicas or originals but also the re-enactment of historic debates. This approach has become a powerful historiographic tool during the past three decades. The idea of building replicas such as Viking boats or Renaissance telescopes can help us to bridge the gap between the desire for more interactivity and the fascination with the historic artifact as well as contribute to raising questions about social and cultural contexts (STAUBERMANN 2009). Moreover, it allows historians of science and technology to engage both with artifacts and wider audiences.

To summarize I had wanted to look at artifacts, history and education, and how the use of the former changed in the context of newly emerging ideas of interaction and practice in the latter. I have shown that both trends in the museum world as well as scholarly developments determine how we perceive and employ artifacts in education. I hope to have been able to demonstrate that artifacts are witnesses of historic social practices. They can be employed as historiographic probes into museum cultures and societies. And they help us, by drawing cultural trajectories through historic practices, to understand what makes science and technology such a powerful discipline after all.

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The historical instruments from Valongo Observatory, Federal University of Rio de Janeiro

MARIA ALICE CIOCCA DE OLIVEIRA & MARCUS GRANATO

Abstract

Valongo Observatory is part of the Federal University of Rio de Janeiro, Brazil. It was founded in 1881 with the primary mission of being used for the practical lessons given at Rio de Janeiro Polytechnic School. It has a collection of around 300 objects used in the teaching and research, including scientific instruments, apparatus and accessories. In this paper we discuss the collection formation, drawing on data about its objects, which were used in practical lessons for the disciplines relating to astronomy, geodesy and topography given at the observatory till the 1950s, and the practical lessons and research conducted as part of the undergraduate course in astronomy after 1958.

Introduction

Brazil's first universities date back to the early 20th century, but there is some debate about which higher education institution came first. Some argue that the first was Escola Universitária Livre de Manaus, established in the heart of the Amazon region in 1909, later the University of Manaus;¹ others argue that it was the University of Paraná,² founded in the south of the country in 1912.³ Still others cite the University of São Paulo, founded in the 1930s, arguing that this was the country's first real university in the full sense of the word.

Officially speaking, Brazil's first university was founded by federal decree in 1920. It first went by the name of the University of Rio de Janeiro, changing to University of Brazil in the 1930s, and finally to Federal University of Rio de Janeiro in the 1960s. Initially, the university merely assembled three schools that already existed in Rio: the Escola Politécnica do Rio de Janeiro (Rio de Janeiro Polytechnic School), the School of Medicine of Rio de Janeiro and the Faculty of Law.

When it was integrated in the University, the Polytechnic School had an astronomical observatory, which continued to exist until today. In this paper, we present and analyze the history of the astronomical observatory's collection of scientific instruments, equipment and accessories, manufactured in the nineteenth and twentieth centuries and used in astronomy, geodesy and topography practical lessons.



Fig. 1 - Astronomical Observatory of the Polytechnic School of Rio de Janeiro on Santo Antonio hill. Photo: unknown. Valongo Observatory Collection, 1921

The astronomical observatory was founded in 1881 with the main mission of supporting teaching of astronomy and geodesy to students of the Polytechnic. It stood on Santo Antonio hill (fig. 1) until the 1920s, when it was transferred to Chácara do Valongo (Valongo estate), on Conceição hill, both in the center of Rio de Janeiro, Brazil. In the course of time, the observatory was named as Valongo Observatory.

The Valongo collection is a typical historical university education and research collection. Its objects were from a public university and were stored and gathered, intentionally or not, as the outcome of the dynamics involved in the development and dissemination of knowledge that took

¹ UFAM. Histórico da UFAM, ufam.edu.br/instituicao/instituicao.htm (accessed May 31, 2012).

² In 1920 it lost its status of university and was broken down into isolated faculties until 1946, when it was again reintegrated, and in 1951, when it became a public institution and started providing free education.

³ UFPR. Histórico, www.ufpr.br/portalufpr/historico-2/ (accessed July 26, 2012).

place inside the observatory; it therefore involves methods, processes and knowledge that are representative of the education and research practices of that institution. The collection comprises some 300 objects and covers the areas of astronomy, geodesy, topography, chemistry and photography. It contains telescopes, pendulums, blink comparator and measuring device, chronographs, and many accessories, such as objective lenses, eyepieces and filters.

The collection can be divided into two groups based on how the instruments were used. One group consists of objects manufactured in the late nineteenth and early twentieth century. They were mostly imported from Europe, with a few notable exceptions of objects produced in Brazil, such as the equatorial telescope manufactured by José Hermida Pazos. The other group consists of objects produced since the 1950s. Most were manufactured by Carl Zeiss and acquired through an agreement between Brazil, the German Democratic Republic and the People's Republic of Hungary (BRASIL 1969), which became known as the MEC-Ministry of Education and Culture/Eastern Europe Agreement.

The artifacts bear marks acquired throughout their existence, imbuing them with values that surpass those derived from mere materiality. When explored, these marks reveal practices, representations, knowledge and techniques used in teaching and research at the observatory. The artifacts are evidence of the influences on the formation of the group's identity. They bridge between the past and the present of astronomy teaching in Brazil. This knowledge made it possible to build up the history of the objects and the trajectory by which the collection was formed, while also contributing to better understanding a part of history of astronomy teaching at the observatory and therefore in Rio de Janeiro, which was little known.

Once they were brought together in the collection as testimonies, these objects became documents bearing knowledge that could be used to build up this trajectory. To obtain the final results, it was necessary to find out and understand how they were used, the scientific practices and ideas of the day, as well as their broader contexts.

Methodology

The research into the marks on the objects from the Valongo Observatory collection was guided by the "cultural biography of things" (KOPYTOFF 2008; ALBERTI 2005) and by Jim Bennett's proposal for using a prosopographical approach in the study of collections, namely when the goal is to study them as a whole, creating a biography of the whole rather than that of the individual objects (BENNETT 2005). Emphasis was put not only on their individual trajectories, but also on the information about social, economic, scientific and political changes and relationships that the institution went through; relationships and changes that thereby influenced the formation of the collection.

Prosopography, or collective biography, is a research method that investigates the common ground in a group's past by collectively studying their lives (STONE 1971, 46). One of its advantages is that lack of data about the individuals from a given group does not prevent working on the group as a whole. Despite being limited, data can, once gathered, be collated and interrelated using systematic criteria such as pre-set questions, show meanings that reveal patterns influencing historical processes (VERBOVEN, CARLIER & DUMOLYN 2007, 36).

Coincidences between the particularities of the collection and the potential uses of the proposed approach indicated that this method would be adequate to study the collection of science and technology objects from Valongo Observatory. Despite shortage of data about the majority of objects, they have points in common, such as provenance, areas of knowledge involved, and use, enabling comparative perspectives and qualitative interpretations needed to interrelate limited data on the

individual components. By doing this, it was possible to gain clarification about acquisitions, uses and losses of objects from the collection, piecing together a far more wide-ranging set of information.

Data collecting was guided by the prosopographic method, similar to that of an individual biography: drawing up questions, whose answers should, after being analyzed, bring to light common features of the individual elements in the group, forming patterns of relationships. These data are often scarce, varied and open to discussion, but when analyzed in the light of the questions, demonstrate the common features and courses taken by the members of the group, providing more comprehensive knowledge about them collectively.

The questions relate to the objects' functions and contexts, which are essential for understanding how the collection was formed and for building up a table of data capable of yielding knowledge on the way the collection and the institution were formed and developed. As such, the questions used were: When was the object manufactured? Who manufactured it? What was the object's function? What kind of object is it? What research and practical lessons was the object used in? What function(s) did the object have in the research or practical lessons? Was it used for technical purposes? For educational purposes? How long was it used? What scientific areas and disciplines was it used for? How was it involved in the course curricula?

Answers were obtained from information in the literature for the conceptual, theoretical basis for the work, and from archival sources related to the context in which the objects were acquired and used in teaching astronomy in Rio de Janeiro. Documents consulted were of administrative, institutional and educational nature, including minutes, reports, letters, regulations, scientific articles, photographs, and the programs and curriculums for the disciplines. They were researched in the national archives, the Museum of the Polytechnic School, the library of Valongo Observatory, the historical records from the Polytechnic School, the municipal archives, the heritage department of UFRJ, and electronic files, resulting in about one thousand documents containing information of relevance to the research, from an initial set of thousands of documents related to the Polytechnic School and the observatory.

Another important source was the markings on the objects themselves. Often, these were crucial in identifying certain objects, a common difficulty when working with this type of collection. Inscriptions involving dates, manufacturers' names, stamps, and engraved plaques were essential for identifying and understanding the importance of certain objects in the collection, such as the '1910' stamped on the T. Cooke & Sons equatorial telescope, the '1880' embossed on the Pazos equatorial telescope, or the stamp of the Scientific Commission for Exploration, which visited Ceará between 1859 and 1861, on a spirit level.

Once data had been collected, they were analyzed in a table (appendix) to build up a scenario that gave a view of the interconnections between them. In the table, data were assembled about intrinsic and extrinsic aspects of the objects: the former being information inherent to the objects themselves, their intended uses and how they were actually used in teaching and research activities at the observatory; and the latter being information on the reference sources for the data presented. The columns' headers were based on the questions mentioned above in order to group together the responses meaningfully. At the end of the table, a column was added for references consulted.

Once the information was inserted into the table, data analysis was undertaken to interrelate the topics and the objects. This produced results which, when combined with the information about the institution and the contexts the objects were part of, enabled the reconstruction of the trajectory of the collection in time. The analysis helped shed light not only on the acquisition and use of the objects from the collection cited in the documents, but also on those which were not mentioned in the sources consulted. Similarities between the objects, especially their type, function and use, yielded knowledge,

albeit circumstantial, about why the objects on which little or no data were found were present in the collection.

This approach made it possible to find out more than just a few pieces of information about the objects. As the collection formation became more visible, it became clear how the contexts of the objects influenced its trajectory, whether in the way they were used or their ultimate destination, individually or as a group; contexts which, more often than not, were determined by the history of the institution itself. Finding out this information did more than merely fill in complementary data for narratives to be used in communication between spectator and object; it drew a picture that translated the way the collection had been formed and helped identify turning points in the trajectories of these material cultural assets, namely: a) the starting point in 1874 when the Polytechnic School was established, whenceforth the first objects were acquired, even before the observatory had been founded; b) the founding of the observatory linked to the Polytechnic School, on July 5, 1881; c) the transfer of the observatory from Santo Antonio hill to the Valongo estate (on Conceição hill), between 1924 and 1926; d) the period when the observatory fell into disuse, between 1936 and 1957; e) the creation of the undergraduate course in astronomy in 1958; f) the acquisition of a set of instruments through an agreement between the Brazilian Ministry of Education and Culture and two countries from eastern Europe in the 1970s; g) the change in attitude towards the instruments marked by the rise of institutional memory preservation projects, as of 1996; and h) the formation of the collection, based on activities undertaken in partnership with Museu de Astronomia e Ciências Afins (MAST).

The history of each individual object from Valongo Observatory cannot be reconstituted. However, the dynamics surrounding their presence in or absence from the collection help us to understand turning points in the formation of the collection, correlations between objects and the event they were involved in, as exemplified below.⁴

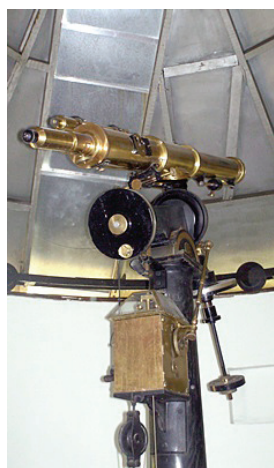


Fig. 2 - Pazos equatorial telescope, manufactured in 1880. Photo: Maria Alice C. de Oliveira, 2010

The trajectory of the formation of the collections at Santo Antonio Hill

On the acquisition of the instruments

The formation of the set of instruments that formed the initial core of the observatory's collection of S&T objects dates back to a period prior to its foundation. This is confirmed in a document sent in 1880 to the Ministry of the Empire (Ministério do Império) by the acting director of the Polytechnic School, Ignacio da Cunha Galvão, containing a request and a budget to purchase a telescope. The document contained notification for the purchase of a telescope that had been examined by Manuel Pereira dos Reis, at the price of seven hundred and fifty réis. Interestingly, a simple receipt from July 24th 1880 documents the purchase of an astronomical telescope for seven hundred and sixty réis. The coincidence between the date of this purchase and the date stamped on the telescope manufactured by Jose Hermida Pazos awakened the suspicion that the telescope in question was the Pazos telescope (fig. 2), one of the main artifacts in the collection because of its originality and use in the observatory.

⁴ OLIVEIRA, M. A. CIOCCA DE. 2011. *A Trajetória da formação da Coleção de Objetos de C&T do Observatório do Valongo*. Dissertation (Masters) – Programa de Pós-Graduação em Museologia e Patrimônio, UNIRIO/MAST, Rio de Janeiro. Supervisor: Marcus Granato.

In 1906, a receipt from Charles Raynsford confirms the purchase of a prism and the repair of a spirit level for the coudé-mounted meridian telescope,⁵ casting light on the acquisition process for the Julius Wanschaff coudé-mounted telescope. Likewise, a letter and an invoice from 1907 elucidate on the acquisition of an astronomical theodolite by Paul Gautier⁶ and a Peyer Farvager chronograph⁷.

Part of the trajectory of another instrument in the collection, the T. Cooke & Sons equatorial telescope (fig. 3), was also explained by the proximity of date in some documents to the date (1910) stamped on the object itself, elucidating the process by which it was ordered, purchased, received and installed.



Fig. 3 - T. Cooke & Sons Equatorial Telescope. Photo: unknown (Valongo Observatory Collection)

A document from 1907 containing a request for information from the manufacturer T. Cooke & Sons was the record that marked the beginning of the trajectory of this object in the observatory. Later, in the official government newssheet, *Diário Oficial*, and in reports by the board of the Polytechnic School of Rio de Janeiro in 1908, further data were found about: the approval of funds for the purchase of a telescope of the same type between 1908 and 1910; the construction of a tower for installing a telescope; and still 1910, the arrival and installation of a T. Cooke & Sons equatorial telescope at the observatory.

On the use of instruments in practical lessons

Students' attendance and the subjects taught in practical lessons at the observatory between 1896 and 1934 were revealed in five record books. These contained notes about the days of the lessons and the subjects given, signed by the assistant and the professor. The analysis of the information yielded insights into the instruments from the collection, and also on the use of similar instruments, as can be seen in the quotations from the books for the periods 1914–1916⁸ and 1917–1918⁹: “The measurement of the zenith distance and determination of the time on the chronometer were investigated”, signed by the professor Amoroso Costa, on August 20, 1914; “Readings will be made of the micrometers of the Gauthier theodolite, and angles will be measured”, signed by the assistant Orozimbo Lincoln Nascimento on August 26, 1914; “The use of maps of the sky was taught and the equator was drawn”, signed by the assistant Orozimbo Lincoln Nascimento on May 23, 1917.

In this period, invoices and reports provide information about instruments and classroom activities, namely subjects given and classroom dynamics. These data elucidate on the use of certain instruments from the collection and enrich our knowledge about their trajectories, such as the P. Gautier theodolite, the T. Cooke & Sons equatorial telescope, the coudé-mounted telescope by Julius Wanschaff, and the Peyer Farvager chronograph and pendulum.

The trajectory of the formation of the collection in Valongo Estate

Transfer of the observatory to Valongo Estate

Between 1924 and 1926, the observatory was transferred to Valongo estate due to improvements planned for Santo Antonio hill. Instruments had to be dismounted, boxed and transported by vehicle or

⁵ Invoice from Casa Raynsford. Rio de Janeiro, December 18, 1906, for one hundred and eighty-five réis, referring to the repair of a spirit level and purchase of a prism (AN- IJ² 187).

⁶ Handwritten request for five contos and six hundred réis for the purchase of a meridian telescope and a P. Gautier theodolite; and a letter dated January 26, 1907, from the Polytechnic authorizing the purchase.

⁷ Invoice from Casa Raynsford dated December 20, 1907, for four hundred and fifty-seven réis (AN- IJ² 183).

⁸ Register of students' attendance in practical astronomy classes at the astronomical observatory of the Polytechnic School on Santo Antonio hill. Rio de Janeiro, 1914-1916. (UFRJ / Valongo Observatory / Library)

⁹ Register of students' attendance in practical astronomy classes at the astronomical observatory of the Polytechnic School on Santo Antonio hill. Rio de Janeiro, 1917-1918 (UFRJ / Valongo Observatory / Library).

on the head of people from one hill to the other, a distance of approximately one kilometer. Among the objects moved were the large equatorial telescopes by Hermida Pazos and T. Cooke & Sons.¹⁰

After 1926, the Astronomical Observatory of the Polytechnic School functioned at Valongo. Practical lessons were given there by the assistant professor of astronomy, Orozimbo Nascimento until his death in 1936. Lessons continued, albeit sporadically, by Dr Allyrio H. Mattos, professor of the discipline until 1954, when he retired.

Few records or information were found between 1936 and 1957. However, a comparison of an inventory from 1920¹¹ with a list of instruments from 1957 showed that the number of instruments had considerably diminished. Although no documental evidence was found, the general abandonment of the observatory in the 1940s and 50s after the death of the assistant is the most likely reason.

The astronomy course at Valongo Observatory

On November 29, 1957, approval was given by the Council of the National Faculty of Philosophy (FNFi) of the University of Brazil¹² for the undergraduate program in astronomy.¹³ Classes began in 1958 and the observatory at the Valongo hill, then part of the National School of Engineering, became the course's practical lessons headquarter, making its facilities and equipment available to professors and students alike.¹⁴

During this stage of the observatory's history, the use of instruments yielded academic and scientific output, with some being featured in the observatory's publications. In 1960, Valongo Observatory published the first issue of the *Astronomy Course Bulletin* (*Boletim do Curso de Astronomia*), a series of five issues published between 1960 and 1966, with the aim of giving "knowledge about the educational works and providing results of astronomical observations made by professors and students of the Astronomy Course", in the words of Luis Eduardo da Silva Machado, professor and director of the observatory (MACHADO 1960).

At Valongo, one of the main innovations was the creation of a small functional photographic laboratory. This was aimed at developing astronomical photographs made in the research and teaching of photography techniques by Professor Guilherme Wenning, from the Military Institute of Engineering. This information explains the presence of objects related to photography in the collection.

Between the 1970s and the 90s, the astronomy course underwent reforms designed to update astronomy teaching. These reforms also introduced different requirements for instruments, leading to modernizations and fluctuations in the number of instruments in the set.

Initially, revised curricula highlighted photographic techniques applied to astronomical observations and reductions through the use of computers, driving the replacement of the existing equipment with new equipment that was more suited to the new technologies (CAMPOS 1995, 4).

In the 1970s, the set of instruments was considerably enlarged when it received equipment resulting from the MEC/Eastern Europe agreement (BRASIL 1969). It received and installed a coudé-mounted

¹⁰ Statement of services rendered on Santo Antonio hill for removal work and the temporary installation of the observatory and the respective funds obtained for this purpose, between 1924–1926 (UFRJ/Valongo Observatory/Library), p. 24.

¹¹ This document, considered a precious part of the historical collection, is a manuscript listing the fixed and movable assets, separated by category of materials. It is divided into three parts: the first with the assets purchased until 1920, the second with items purchased in 1921, and the third with photographs of some of these assets (UFRJ/Valongo Observatory/Library).

¹² In 1920 the Polytechnic School of Rio de Janeiro, the National Faculty of Law and the National School of Medicine, composed the University of Rio de Janeiro, which was later renamed the University of Brazil and, later, the Federal University of Rio de Janeiro. The astronomical observatory of the Polytechnic School, later known as Valongo Observatory, was part of this entity.

¹³ Minutes of an extraordinary meeting held on November 29, 1957, at the National Faculty of Philosophy – FNFi (Faculdade Nacional de Filosofia) (UFRJ/PROED/Arquivo).

¹⁴ Minutes of the meeting of the Council of the National Faculty of Philosophy (FNFi) of the University of Brazil held on April 8th 1959, p. 4f. (UFRJ/Museu da Escola Politécnica).

refractor telescope, which was important for researching the sun; four portable telescopes for use in teaching and in university research projects;¹⁵ a planet camera; a GII fast photometer with accessories; a SP-II model spectra projector with accessories; a blink comparator; achromatic lens; an Ascorecord coordinate measuring device (coordinatograph) for use in the reductions and interpretations of data resulting from astrophysical observations.

This equipment and accessories such as plate brackets and chassis are today part of the collection. When in use, they assisted the astronomy course lessons, as well as research conducted at Valongo Observatory, and also in outreach activities, such as observations aimed at the general public. Special emphasis should be given to studies related to the field of astrometry developed between 1980 and 1990 together with the astrometric telescope at the Capricorn Observatory in Campinas,¹⁶ the coordinatograph and the comparator of astrographic plates, which formed a set of instruments whose coordinated use yielded, published academic and scientific papers.

In the course, they were used in fundamental science and research,¹⁷ including projects on astrometry, photometry of asteroids and comets, and to obtain precise positions of celestial objects on photographic plates. They were also used in reducing data from the astrographic plates obtained by the observatory's astronomers at the European Southern Observatory (ESO, La Silla), in the Chilean Andes, and the Estación de Altura El Leoncito, astronomical observatory of the University of San Juan, in the Argentine Andes (MACHADO 1984, 3). They were also used in community outreach projects, when the telescopes were mounted specially for astronomical observations of events such as eclipses and passages of comets. When Halley's Comet passed in 1986, the event was observed by the visiting public using portable telescopes, including four Zeiss/Jena portable telescopes and the Zeiss/Jena astronomical telescope, which was placed on Sugar Loaf for the public to observe the phenomenon.

New trajectories

Since the 1990s, with new technological innovations, a lot of the equipment used at the observatory has been replaced. It has partly been put aside and safeguarded by people who valued it in some way, and partly has remained untouched, perhaps because of its size, which made it hard to dispose of.

In the late 1990s, concern about the preservation of elements relating to the institution's memory awakened an interest in recovering these objects.

Thus, in 1996, a survey was carried out in order to find out which objects still existed and could be considered historical, highlighting the need to adopt measures for their restoration and preservation. As a result, between 1997 and 2005 a project for the preservation of the astronomical memory of Valongo Observatory was developed in three phases, involving the restoration of a few instruments and domes and the preparation of specific areas to exhibit the restored instruments. Based on the results, two new projects have begun in 2007 and 2008, involving the recuperation of another exhibition area. Also in 2008, an agreement was signed between Valongo Observatory and MAST for the restoration, identification, documentation and organization of the objects.

¹⁵ Report of the activities of Valongo Observatory in 1973 (typewritten) (UFRJ/Valongo Observatory/Library).

¹⁶ Due to a lack of appropriate atmospheric conditions and terrain, this equipment could not be installed at Valongo. It was sent to Campinas, Brazil, where a building was built to receive it in Pico das Cabras, a region that has been considered favorable for the installation, which was made via an agreement between UFRJ, the Campinas local authority, UNICAMP and PUCC, establishing a program of technical and scientific cooperation, especially in astrometric surveys.

¹⁷ Document n. 58/87 dated June 11, 1987, from the Board of Valongo Observatory to the Dean of UFRJ (UFRJ/Valongo Observatory/Library).

As a result of these initiatives, a set of documents that represent the memory of the institution and part of the history of the teaching of astronomy in Brazil, especially Rio de Janeiro, has been preserved, also an integral part of the university's heritage and the country's science and technology heritage. This set of objects includes the collection of S&T objects from Valongo Observatory.

Concluding remarks

In this study, the use of prosopography proved valuable for building up the trajectory of a set of objects that today constitute a university collection. The large quantity of documents consulted yielded information that cast light on the different stages the objects went through on their course from being useful to being obsolete and abandoned, and finally to being acknowledged as evidence of the working life of the observatory, vestiges of a past that deserves to be reconstituted.

As the trajectory of the objects was pieced together, each object or group of objects from the collection was explained in such a way that confirmed its role in the activities undertaken at the observatory. While the collection's trajectory was being built up, it was interesting to understand that the most important thing was not to confirm what was said in documents about an object in the collection, but to realize that the information characterized it as a real item from that collection, not only for its use, but mainly because it was important in constructing the institution's identity and was instrumental in the development of Brazilian science and technology.

The knowledge about the ways and contexts objects were used showed how important this collection is as a historical legacy to a university's teaching and research work. Data gathered from the artifacts were used to build up part of a history that was previously unknown and also provided contributions that could serve as bridges between the collection and its observers.

In the scope of museology, efforts that led to the formation of the collection provide a glimpse of its future transformation from a 'collection' to a museum collection, when the information obtained about the objects can be used to construct narratives about the teaching of astronomy in exhibitions open to the public, and in activities such as university outreach projects.

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Annex

Table of interrelationships between objects from the collection of science and technology instruments from Valongo Observatory (example) – part A

<i>Valongo Observatory record</i>	<i>Data on the manufacturing of the object (name, manufacturer, place and date)</i>	<i>Use of object in teaching and research (practical lessons, projects and research activities)</i>	<i>Topic(s) related to its use</i>
Cooke telescope Valongo Observatory 2008/146	Equatorial telescope Manufacturer: T. Cooke & Sons Place of manufacture: London, UK Period: 20 th century (1910) 300 mm diameter 5500 mm focal distance	Practical lessons Projects and research – international observation programs and astronomical research for photographic records Swiss Federal Observatory, Zurich, Royal Greenwich Observatory and Yale University Instrumental Techniques I - 1984	Description, assembly and handling; astronomical instruments; determining errors, time, azimuth; Observation – satellites and craters (Jupiter, Saturn and Moon) Astronomical photographs; visual, photographic, photometric, spectroscopic, thermoelectric and polarimetric observations Photographic records: solar photosphere, moon's surface, planets' surfaces, solar and lunar eclipses, micrometric observations of double stars and meridian astrometry, record of occultations of stars by the Moon and position of comets
Astrometry Valongo Observatory 8/149	Ascorecord coordinate measuring device (coordinatograph) Manufacturer: Carl Zeiss Place of manufacture: Jena, Germany Period: 20 th century Dimensions: height: 0.95m diameter: 1.07m	Practical lessons Astrometric research Projects Astrometry II	Astronomical photography Photometry (astrographic plates)

Table of interrelationships between objects from the collection of science and technology instruments from Valongo Observatory (example) - part B

Valongo Observatory record	Scientific output	Objects used in conjunction with / relation to this object	Place of use	Document(s) consulted about the objects in the collection or related to their use (**)
Cooke telescope Valongo Observatory 2008/146	Studies into sunspots; Jupiter's satellites; occultations of stars by the Moon; Astrometric Photographs and photographic records of phenomena that took place in Rio de Janeiro – total and partial eclipses of the Sun and the Moon Observations of the transit of Mercury by the Sun Interpretative model of the progression of the shadow in a total eclipse of the Moon	Chronograph Photographic equipment and material Filar micrometer Tape chronograph	Polytechnic School Valongo Observatory	Date (1910) engraved on object; Letter dated Nov. 28, 1907 Handwritten letter dated July 23, 1908; Letter dated Jan. 22, 1909; letter dated Feb. 9, 1910. Polytechnic School reports – 1908, 1909, 1910.- <i>Diário Oficial</i> (government newssheet), of May 13, 1908, Jun. 9, 1908, Aug. 8, 1908, Jun. 1909; Oct. 1910, Aug. 1911. Statement of services – transfer – Jun. 30, 1926. Amoroso Costa Fund; Valongo Observatory bulletins – 1-6; <i>Contribuições do Observatório de Valongo</i> – series I to III. Class registers 1896-1934. Class registers Jan. 31, 1917, Feb. 2, 1917, May 23, 1917, Jul. 6, 1917. Inventory and lists from 1911, 1920, 1957 1957 list - CBPA Curriculum 1960 – <i>Boletim do Observatório de Valongo</i> n.1 Curriculum – 1963, 1968, 1975, 1984, 1994. Report on [activities] Sep. 19, 1962 <i>Contribuições do Observatório de Valongo</i> – Series I, II and III – 1966-1972 <i>Boletim do Observatório de Valongo</i> n.1-5 (1960-1966)
Astrometry Valongo Observatory 2008/149	Geoscience Year-book 1995 v.18 (CAMPOS)	Microdensitometer for astronomical plates Blink comparator Graphic recorder for micro-densitometer Astrometric telescope	Valongo Observatory	Decree # 861 – Sep. 11, 1969 – Agreement between Brazilian Ministry of Education and Culture and East European countries Terms of responsibility -1971 Delhaye report – 1972 Valongo Observatory report - 1973 Curriculum – 1975, 1984, 1994 Letter from Valongo Observatory 1976 Astrometric telescope – 1984

University, socio-economic history and identity: The Museum of Foreign Debt, a museum without a collection

MARÍA DEL CARMEN MAZA & GRACIELA WEISINGER CORDERO

Abstract

How did a topic linked to macroeconomics come to be part of the cultural identity of a country and have a museum? The idea of its creation arose in the mid-2001, when a group of graduate students and professors from the Faculty of Economic Sciences of the University of Buenos Aires began to hold meetings and discussing the matter of foreign debt. In 2003, the task on creating "a space to illustrate in a didactic and attractive way the history of Argentine debt" was commenced; initiated by the Managing Council. The first exhibition "Foreign Debt: Never Again" was opened in April, 2005.

This museum was created with the aim – according to the director's thinking – of cooperating in the construction of citizenship in the frame of the historical memory and spreading the problematic of the foreign indebtedness, a topic that identifies all the Argentineans in their daily life. Opened to the general public and to the university students of all faculties, it has a permanent exhibition that is complemented by the resources of comic strips and a series of changing videos. In addition, its center of documentation offers investigators the most complete documentary base on the topic in the country. The important question is: does it allow the visitors who do not have a thorough knowledge of the subject to think about the facts from an objective point of view or does it impose an ideological message on them?

This paper investigates the originality of the topic and analyzes the mission of this museum, in relation to its museological discourse, its contribution to the construction of citizenship and the promotion of critical thinking.

Introduction

"The word museum refers to a place for gathering, keeping and exhibiting collections of objects with common characteristics and, sometimes, historical value. Nevertheless, the background to the exhibit to be displayed at the Ernesto Sábató Cultural Centre, in the basement of Buenos Aires University's School of Economics, is quite peculiar. It is none other than the 125,283 million dollars that Argentina's foreign debt amounts to. There are no bills, of course, but an installation with data and allegories which aim at reminding us that Argentineans were not born with the foreign debt tucked under our arms but, rather, that there were politics and politicians that favored certain sectors at the expense of the majority".

This is the way a journalist from the best selling newspaper in the country commented on the inauguration of the then-new Museum of Argentina's Foreign Debt in 2005 (Demarco 2005).

The idea of its creation arose in mid-2001 and, according to its director, it aimed at diffusing Argentina's Foreign Debt issue among the country's inhabitants and citizens, as well as among the foreigners who come to study an iconic foreign indebtedment process, and at aiding in the construction of citizenship in a historical memory framework. The foreign debt is an issue every Argentinean can relate to on a daily basis.

Its goal is to fulfill one of the cornerstones of the public university, such as university extension, and to strengthen the bond between the University of Buenos Aires' School of Economics and the society it belongs in. It also aims at generating a space for critical reflection while diffusing Argentina's foreign

debt issue, becoming a clear manifestation of the university's social responsibility, which is a part of the Student Welfare Department's vision¹.

In Argentina, issues such as inflation, the foreign debt and country risk, belt-tightening measures, the IMF, and the Paris Club, have been daily conversation topics for decades. Every citizen feels they are qualified to discuss these issues even if they lack academic knowledge about them. This holds true for all social, economic, cultural and professional levels; among friends, relatives, colleagues and, astounding as it may sound, also among strangers – such as a cab driver and his passenger, or a waiter in a bar and a customer.

Has it always been like this? No. While there was certainty about the short and medium-term economic future, the issues we concerned ourselves about were different: political ideologies, education, and even culture.

From idea to realization. The museum's origins and goals

In mid-2001, a team of graduates and faculty members of UBA's School of Economics started meeting to discuss the foreign debt and the amazing ruling about the lawsuit brought by journalist Alejandro Olmos in 1982, claiming that the country's foreign debt should be declared unlawful.

In the aftermath of the December 2001 crisis and the subsequent unforeseen events, the team kept working on this issue, gathering a great deal of material resulting from their research and document information.



Fig. 1 - December 2001 crisis in Argentina. Photo (left): G. Weisinger Cordero, Covers of Argentine newspapers 20 and 21 December 2001. Photo (right): Rodrigo ABD for *La Nación* Newspaper

Created in 2003, the museum was opened to the public in 2005 featuring the exhibit *Foreign Debt: Never Again*,² designed from a script based on Alfredo and Eric Calcagno's book, *La deuda externa explicada a todos (los que tienen que pagarla)* (*The Foreign Debt explained to everyone – who has to pay it*). In 2009 it closed down provisionally due to refurbishment to be re-opened at its new venue in 2010, the country's bicentennial year.

¹ The goals have been set by the museum's authorities.

² The museum opened with an exhibit called: *Foreign Debt: Never Again*, a title which is immediately associated to the book *Never Again*, containing the report by CONADEP (National Commission on the Disappearance of Persons).



Fig. 2 - The museum in 2005 with several spaces of exhibition.
Photo: Museum of Argentine Foreign Debt

Its target visitors are high-school and college students, both local and foreign tourists and the general public.

The exhibit is organized chronologically from the independence period to the present. It does not have a collection, and the museum discourse is made visible through reproductions of graphic and TV media, using iconic objects – some of which have been intervened by artists – to illustrate some topics:

- the first loan requested in 1824, a few years after the country's independence from Spain;
- Argentina's joining the IMF, in 1956;
- the military dictatorship period from 1976 to 1982;
- the Olmos lawsuit and financial speculation (colloquially *bicicleta financiera* – literally: financial bicycle);
- the return to democracy with Raúl Alfonsín's administration (1983–1989), the declaration of default in 1988 and hyperinflation;
- Carlos S. Menem's two administrations: the Brady Plan, the Convertibility Regime;
- analysis of the Alianza administration (1999–2001) and their economic measures – shielding (*blindaje*), megaswap (*megacanje*), banking restrictions (*corralito*), belt-tightening measures;
- the declaration of default by Rodríguez Saá's fleeting administration;
- the end of convertibility in 2002 and economic recovery as of 2003, focusing on the decline of unemployment, the burden of the debt on the Gross Domestic Product (GDP) and the early emergence of a new accumulation pattern.
- A specific thematic room shows the relationship between Argentina and the IMF – given the significance attached to it. In 2006 it was the 50th anniversary of the relationship with this organization and the museum 'celebrated' it by dedicating this room to the event.

In order to develop its museologic and museographic script, the museum got to having five rooms over its first period.

How did an issue linked to macroeconomics get to become a part of a country's cultural identity?

According to García Canclini, culture refers to the “production of phenomena that contribute, through symbolic representation or reelaboration of material structures, to understanding, reproducing or transforming the social system” (GARCÍA CANCLINI 1983)³.

On the other hand, constructing one's identity is a cultural, material and social process all at once. In doing so, individuals define themselves culturally or collectively in an intimate symbolic interaction with others through religion, gender, class, profession, ethnicity, sexuality, and nationality, which contributes to specifying individuals and their sense of self.

³ Our own translation.

In 1993, at the II Seminario Latinoamericano sobre Patrimonio Cultural *Cultura, Museos y Política Económica* (II Latin-American Seminar on Cultural Heritage *Culture, Museums and Economic Policy*)⁴, Brazilian professor Ulpiano T. Bezerra de Meneses stated: “For at least one generation Brazilians have not been able to imagine what a day without inflation might be like. In order to survive, such a myriad of habits, mechanisms, practices, expectations – values – developed that it is safe to speak of an ‘inflationary culture’. The freezing of the savings account deposits⁵ (perhaps the most popular financial operation among the Brazilian middle class) for 18 months [caused people to react to such a measure] not just because it made their material lives more difficult, but also because they viewed it as true ‘memory hijacking’, an insult to a past built little by little through the deposits of their meagre savings. Once again, ignoring the cultural implications of economic decisions brought about problems and confusion. [...] In fact, to begin with, two elements which are pervasive in our social existence in both qualitative and quantitative terms, the habitual and the world of labor, are rendered deprived of the benefits of culture.” Argentina saw a similar process to the one described by professor Meneses.

Following Arnold J. Toynbee (1972), if we do not consider the historical background in each case, it becomes impossible to make sense of subsequent events, of contemporary ones.

Economy, culture and identity

The adjective ‘cultural’ is often used with an automatic, objectively positive connotation to indicate something good, respectable, advisable, legitimate and legitimating.

According to Honneth, a well integrated identity depends on three forms of recognition: concern for the individual (which provides self-confidence), respect for his/her rights (which grants self-respect) and appreciation of his/her contributions (which guarantees self-esteem). When an emotional reaction is negative (anger, outrage), it turns into the motivational basis of a struggle for recognition. Disrespect in those three spheres may be the source of collective forms of social resistance and struggle. However, these do not automatically result from individual emotional responses. Only if there are ways to intersubjectively articulate such emotions into a social movement will collective forms of struggle arise. This is what happened in Argentina in 2001: ordinary citizens saw their quality of life immediately affected as a result of what they considered to be mismanagement by the government, and they took to the streets demanding that “they should all go”⁶.

Some reflections on discourse

“A one of its kind, the museum is a place for sheltering and diffusing historical and cultural events that will allow visitors, through reflection, to get near the truth about the existence of Argentina’s foreign debt”, states Simón Pristupín, the driving force of the project and first museum director.

Given the importance of this issue in today’s society and, especially, in the lives of Argentineans, addressing this difficult question becomes a *prima facie* true commitment to the college’s social responsibility.

Still, does the construction of citizenship in the framework of historical memory have one single truth?

It is important to acknowledge that national identity lies at two opposite ends of socio-cultural reality. On the one hand, there’s the public sphere, as a variety of articulated, highly selective discourses constructed from the top through various cultural institutions and agents. And at the bottom of the social structure, there is a form of subjectivity both from individuals and from a range of groups, which

⁴ Held in Buenos Aires, Argentina, and sponsored by ICOM Argentina.

⁵ This took place in Brazil during Collor de Melo’s administration.

⁶ People demanded that all the politicians should go.

conveys very diverse feelings, not always accurately depicted by public renderings of them. Their private counterparts, though, are more implicit and contradictory in nature, as well as less articulated than public discourses.

The role of cultural institutions in the construction of different versions of national identity is remarkable, but there is no argument that the state has a great impact on the articulation of the discourses of this identity. This is achieved through the discourse of its own educational and cultural institutions, of the various institutions belonging to it, the communication media it controls, and through the creation or supply of a great deal of the contents and symbols of national identity (LARRAIN 2003).

“We want the Museum of Argentina’s Foreign Debt to allow people to really understand, as clearly as possible, what the foreign debt is and how it originated. In the darkness of ignorance lie the moves that have turned the debt into hunger and poverty”, adds Simón Pristupín.

In this case, the discourse has focused primarily on third parties’ responsibility, namely, former administrations both democratic and non-democratic. Also, it has targeted foreign agents, the creditors, particularly the IMF – which, for all its stigmatization as the source of all evil, owned only 9% of the total amount of our foreign debt. The debt has been cancelled by the present administration, with great speeches leading us to believe that the major creditor was being paid up when in fact it was a minor one. Additionally, Argentina has not stopped being a member of the IMF, and it continues to pay its member fee.

Made-up reality

Beyond exhibition, the museum’s aim is to further clarify this complex issue by featuring a series of cartoons, which make it possible to convey some aspects of reality. Select cultural elements are rendered by the messages into their representations, constituting a discursive whole.

The comic is an autonomous literary genre with its own structural elements and an original communication technique based on the existence of a code shared by the readers, which the author resorts to – following unedited formative rules – in order to articulate a message addressed simultaneously to the intellect, imagination and taste of the readers themselves.

The semantic elements are arranged by means of frame grammar, and the successive relationship among them creates an ideal continuity. Readers connect the elements in their imagination and perceive them as a continuum. It is worth pointing out it has been proved that in the context of a series of framings it is possible to convey an ideological statement relating to the universe of values (ECO 1964).

The comic strips published by the Museum of the Foreign Debt feature the following content:

1. *D.E.U.D.A* (Spanish acronym for: foreign debt, an Argentine Cartoon): based on Alfredo and Eric Calcagno’s book *La deuda externa explicada a todos (los que tienen que pagarla)* (*The foreign debt explained to everyone – who has to pay it*).

2. *An Intruder in the family: 50 years of the Argentina-IMF relationship*: IMF conditionality, stated in its recipes, the complicity of internal sectors from indebted countries, and also some degree of ignorance by others, together with the unlawfulness of the background – evident in the de facto governments –, arise as the thematic cores of such a complex relationship. The IMF is personified as an American intruder “sneaking in” in order to take away all that has been achieved through great sacrifice.⁷

⁷ Argentina’s major creditor is Germany, though, with 30%, followed by Japan and The Netherlands –and the USA ranks number 6.

3. *CANJE: Deuda x Educación (SWAP: Debt x Education)*: This comic explains the procedure of swapping education for debt – a strategy designed by Brazil's and Argentina's Ministers of Education as debtor states, which was timely submitted before the U.N.

4. *D.E.U.D.A. 2: Los Imperios Contraatacan (DEBT 2: The Empires Strike Back)*: It tells the story of Argentina's foreign indebtment from the time the first loan is requested, in 1824, until 1976.



Fig. 3 - The cartoons *It aims at diffusing this issue in an easy, youth-friendly way, An allegory of the relationship between Argentina and the IMF, SWAP: Debt for Education*. Photo: G. Weisinger Cordero, Covers of the magazines

Comics tend to be effective to reach the young or genre fans. However, comics do not use only linguistic terms as signifiers but also iconographic, monosemic elements.

Following Umberto Eco, an image is the indisputable, visible summary of a series of conclusions arrived at through cultural elaboration. In this particular case, the opposite direction has been followed: an image was built, personifying the IMF, and it was decreed guilty of the state of affairs, as if the point were to incorporate that guilt into the cultural background without further objections.

From comics to video

Reading comics posed some limitations, though, since readers need to be familiar with the genre and, on the other hand, it is impossible to tell the story of the indebtment without using long text panels. Inclusiveness seems to be paramount, and TV is the best medium to achieve it since it does not require academic credentials (SARLO 2011). Therefore, this was the chosen tool, and the video was broadcast on the official channel. Thus, the saga *Martians. A Chronology of the Foreign Debt* was produced. Its launch was announced during a speech by the President from the Presidential House,⁸ as a new venue for the museum was inaugurated.

Planet Earth, year 3668. A group of Martians arrives in planet Earth to do research only to find out humans had disappeared 1,400 years before due to a nuclear disaster. However, in the region where Argentina had been – right across from BA's iconic obelisk – they come across an economist who will try to explain to them about another type of 'self-extermination': Argentina's foreign debt. Interspersed with images (live-action, non-animated ones) negative innuendos are stressed through ever-bigger

⁸ It is worth pointing out that both in the video and the comic the unlawfulness of the debt is stressed, but the President made it clear in her speech that her administration does not intend to stop paying. There has been a speech for the people – feisty and revolutionary – and one for the creditors – we will honor our debt timely–, whenever the country's reliability is at stake.

figures of the foreign debt and intertitles such as: *treason, death, greed, lies*. A country turned into ruins because of the foreign debt and the policies implemented by prior administrations. The series comprises six, 25-minute chapters.⁹ It can also be seen in theaters.

The discourse used is that of the above-mentioned comics.



Fig. 4 - Unemployment rate represented by St. Cayetano, patron saint of labor. Photo: *Clarín Newspaper*, www.edant.clarin.com/diario/2005/05/03/conexiones/t-968773.htm

Unidirectional or open discourses?

Does a single discourse which does not enable discernment allow the layman visiting the exhibition to ponder the events from an objective viewpoint? Or does it merely impose an ideological message? May the basic nature of the discourses be considered democratic and anti-elitist?

Over the last few decades we have seen a growing trend to turn a fragment of reality into just enough: from the bare minimum, a universe, and from the universe, something minimal, losing sight of the concept of interdependence and privileging fragment interpretation over a comprehensive concept of the real.



Fig. 5 - Cardboard picker (cartonero): a 'profession' stemming from the severe 2001 crisis. Photo: www.flickr.com/people/dandeluca/



Fig. 6 - Imitation gold artistic representation of a cardboard picker's cart at the museum. Photo: Museum of Argentine Foreign Debt

A partial interpretation of events through some key word or concept – using religious symbols or iconic elements that represent indigence – should not create a false reality but one which leads citizens to engage in a game of interchanges allowing for multiple readings and interpretations, making them committed, democratic, and inquiring individuals.

⁹ The series has been produced by public television, the *Encuentro* Channel (state run) and the Museum of the Foreign Debt, which belongs to UBA's School of Economics.

Let's not forget that discourses aiming at a single, true viewpoint are in fact the most selective and excluding ones: just a few basic traits are selected and many others are disregarded. Their capacity to represent the underlying social and cultural diversity is inevitably limited.



Fig. 7 - Examples of the museum discourse. Photo: G. Weisinger Cordero



Fig. 8 - The museum today. Photo: G. Weisinger Cordero

This is a particular case when citizens, engulfed in an uncertain future, take a crisis as their identity. The process can be seen in the use of explosive language – or iconic one, from comics and videos – as tools for communicating conclusions that should be open enough to enable reflection leading to finding answers. Yet, is “an installation with data and allegories aiming at reminding us that Argentines were not born with the foreign debt tucked under our arms”,¹⁰ really a museum?

¹⁰ DEMARCO 2005.

Whether a museum or an interpretation center,¹¹ it should assume its role as a public place claiming to be a mirror of society reflecting both its positive and negative sides, as a place for interpretation, deliberation and negotiation, as well as a repository of information, resources, etc.

In order to grasp the fluctuations and incidence the issue of Argentina's foreign debt exerts on the country's everyday matters, let's consider that when the abstract of this paper was submitted, in April 2011, the debt amounted to 150 billion dollars. Just three months later, it reached US\$ 173, 147 billion. Historians think that to analyze things with enough objectivity, at least 50 years should go by after the events, so that official records can be accessed, people will have calmed down, and issues will be addressed more impartially and dispassionately. However, in view of the international situation and from the standpoint of a university museum, addressing the issue of nations' indebtment becomes extremely interesting in the quest for a more harmonious world.

A binary logic works by favoring radical trust or distrust, but museology's philosophical basis lies in learning to question by meditating; accepting that no questioning boils down to the terms of what is expressed but, on the contrary, to discovering the 'unexpressed', whether willingly or unwillingly. The 'notions' that are grasped from the unexpressed (not the concepts or ideas that get across immediately) are the richest contribution to an individual. They will be passed on to his/her peers in order to shape unanswered questions. It is in that exchange that communication and diffusion could have a more realistic nature, without resorting to representations with high, instant impact, but low credibility.

Visitors may often disagree with the material on display or feel upset about it, about its content, but if they keep interested in what they see it means they feel respected in terms of the quality of the information they are getting. That can be a very interesting starting point, especially for university museums, which may thus turn into places where debate over major social issues is encouraged.

Although, as its mission well states, this museum wishes to contribute to the construction of citizenship in a historical memory framework, it is important to point out that museum discourses should inquire into the past as the reservoir containing the major elements of our identity. They should also look into the future and aid in the construction of an identity project based on a range of versions of national identity representing various interests, values, and social groups.

It is in nurturing critical thinking that the museum's best reason for existing lies.

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¹¹ ICOM recognizes interpretation centres as museums, provided they do not have a collection, a set of witness objects that enable more than one reading. Is it logical for interpretation centres to be referred to as museums?

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University collections and object-based pedagogies

ANDREW SIMPSON & GINA HAMMOND

Abstract

Engagement with objects, either directly or through digital media, has long been recognized as a viable, constructivist pedagogy, capable of mediating significant meaning and context. The increasing uptake of digital technologies in university learning and teaching programs provides a timely opportunity for integrating museum and collection data and metadata in these programs.

This project looked at the use of university museum and collection objects in teaching programs through a controlled experiment. A group of students were exposed directly to collection objects while another group was exposed to their digital surrogate. Students were then tested at later stages concerning their recall of didactic information. Results clearly show that students exposed to the original object had far better didactic recall over a longer time period than students exposed to their digital surrogates. This has implications for the development and rapid expansion of online education delivery in the tertiary education sector and elsewhere and the role university collections can play.

Introduction

Developing positive learner experiences in higher education through a mixed pedagogic approach with measurable outcomes is essential. Engagement with objects, either directly or through digital media, has long been recognized as a viable, constructivist pedagogy, capable of mediating significant meaning and context. The increasing uptake of digital technologies in university learning and teaching programs provides a timely opportunity for integrating museum and collection data and metadata in these programs.

The concept at the core of this project is the desire to enhance the learner experience in a range of inter-disciplinary contexts through the development and/or enhancement of object-based pedagogies. This aim was in accordance with promoting “excellence in learning and teaching”¹ and the proposal was successful at securing initial funding through the 2010 Priority Grants Scheme at Macquarie University. This is an internal funding scheme that supports new developments in teaching and learning on campus that have the potential for broader application and adaptation for use by university teachers. To achieve this funding support it was necessary to prove that the proposal aligned with the scheme’s goals of guaranteeing quality and on-going enhancement to both curriculum and teaching methods employed via flexible pedagogical patterns; by providing resources for new ways of engaging and research that in turn informs learning and teaching practice.

Conceptualizing the proposal was based on the initial observation that many university museums have developed from teaching collections. Historically speaking, some academic areas lend themselves more readily to the development of collections than others. The report *Museums in Australia 1975*, otherwise known as the *Piggott Report*, recognized geology and anthropology as the two intellectual areas most likely to develop university collections in Australia at the time. These subjects have always traditionally entailed an approach that, at least partially, was supported by object engagement. As noted by Chatterjee (2010) object-based learning was an integral part of the student experience in the 19th and early 20th centuries.

It is well known, however, that changing pedagogic approaches and changing research and outreach priorities over time can have a significant impact on the value a university ascribes to a material

¹ Goal 2 of the university’s 2008 to 2012 Learning and Teaching Plan.

collection and hence even its survival in an academic context (MEADOW 2010). Furthermore changes in the actual academic structure of the university through the merging and splitting of departments and faculties may also have an impact on the long term viability of an academic material collection.

To maintain material collections, it is therefore essential to extract the maximum amount of value from them in supporting the business of the university. In the area of learning and teaching, the ability to deploy a collection for new pedagogic purposes beyond the intellectual area that first fostered the growth of the collection, is therefore a valid extension of collection utilization that builds new value and purpose for the collection. The opportunity to pursue new creative uses for collections in teaching, however, is not always apparent to teaching staff within a university who may have little knowledge of available material and / or be bound by traditional academic discipline practice that precludes an exploration of inter-disciplinary teaching options. New uses for collections are therefore often best brokered by staff working directly with university collections themselves. These people are best placed to develop new creative uses for the objects within their care in line with the institution's aspirations.

Desired outcomes

In 2008 Macquarie University undertook a thorough overhaul and restructure of its undergraduate degree programs. Part of this restructure included the establishment of what are called 'people' and 'planet' units. These are units of study from all parts of the university that are considered to satisfy the following specific criteria in addressing the development of cognitive capabilities among learners. 'People' and 'planet' units are now established as the central strategy for cross-disciplinary undergraduate learning experiences at Macquarie University. These units are delivered to cohorts of students with diverse backgrounds and interests.

'People' subjects focus on the development of what it means to be engaged and ethical local and global citizens. Subjects accredited as 'people' units are concerned with engaging students with the challenges of contemporary society and with knowledge and ideas; open to other cultures and perspectives; and with a sense of connectedness to others and country. 'Planet' subjects engage students with an understanding of science and the challenges of issues currently facing the world. Subjects accredited as 'planet' units are concerned with the development of students who will have a level of scientific and information technology literacy, and who will be informed and active participants in moving society towards sustainability.

In the new curriculum all students will be required to complete at least one 'people' subject and one 'planet' subject as part of their undergraduate degree. This is to ensure students study some units outside of their primary discipline. These units are therefore attracting higher levels of enrolment than other units, but more importantly, will attract a diverse student clientele from a range of discipline areas.

For this reason these units were targeted for this project as they represent a central strategy for cross-disciplinary undergraduate experience. These units are delivered to cohorts of students with diverse backgrounds and interests – via various modes of delivery. Developing positive learner experiences through a mixed pedagogic approach with measurable outcomes is therefore essential to ensure the best results from the curriculum restructure. The value of engagement with objects, either directly or through digital media to create a space for mediating meaning and context (HOOPER-GREENHILL 2007), has long been acknowledged. The increasing uptake of digital technologies in learning and teaching programs by the digital native student (TAPSCOTT 2009; BRUMBERGER 2011) provides a timely opportunity for integrating museums and collection data in these programs and the challenges that may need addressing in this process.

The project is divided into two parts. The first aims to develop means of measuring both the value of object engagement and engagement with digital surrogates. The second part of the project will involve mapping unit content for 'people and planet' units against existing on campus collections.

Several methods have been employed to ensure measureable outcomes, the majority of which have been qualitative. These methods include measuring the pedagogic effectiveness of two forms of object engagement, and the initial development of a strategy for object-based learning in cross-disciplinary contexts and devising effective strategy for the use of material collections on campus to reach these outcomes.

Methods

The methods used to gain initial data for this project centered around controlled analysis of student learning experiences through their engagement with objects, and experiment on the retention of didactic information through direct and virtual engagement. Contact was made with the conveners of all 'people and planet' units of study running in 2010 – the year this project started – and a copy of the study guide was requested of each of them so that they could be assessed for both current use of material collections, and possible links to material collections for future use in their courses. Of the 52 conveners contacted, 22 conveners provided the study guide as requested.

The study guides provided by the unit conveners were examined for possible links that could be made to university collections. Some units were already actively using collections; this was limited in extent, and mainly confined to a limited scope within archaeology units (Ancient Cultures Museum material) and a few modern history units (Australian History Museum material). The potential of the many collections on campus was not being utilized to anywhere near their potential.



Fig. 1 - A selection of objects used for an experiment with students to test the differences in terms of retention of information through exposure to the original object in comparison with exposure to a digital surrogate. Photo: G. Hammond

While the authors have a fairly extensive knowledge of certain collections on campus, in-depth time was required with the databases of these collections to extract possible links to the people and planet units. The issues generated because of the way in which the varying collections accession and maintain records on objects within their collections will be explored further shortly, as this has had impact on the progress and direction of this project; however a diverse selection of objects from three collections were selected for use in the analysis of student learning experience generated through object engagement (see fig.1).

A first an obvious conclusion from the project is that a good, single unified information management system for all university collections is essential. Much of the poor levels of awareness by university teaching staff can be attributed to the difficulties in tracking down information about the content of collections in areas outside of the academic staff member's disciplinary interests. To foster cross-disciplinary uses of collections in teaching information must be readily available from all collections so that academic staff can consider the use of objects when designing and developing content for the individual units or subject areas they convene. An advanced system for teaching staff

should also have the capacity to record teaching uses of individual collection items, this could be achieved by tagging individual database items with subject or unit codes, semester dates, and even notes on how it was utilized. In this way a history of usage can be developed which can inform future curriculum design. This follows the same principles that many university libraries use to track the use of literature in a non-digital form. Metadata tagging also allows the building of extra context that can enable new cross-disciplinary possibilities.

Object engagement and student observation

Students used in this project were a mix of internal, external and composite mode under graduate and post graduate students, majoring in either the Faculty of Arts or the Faculty of Science at Macquarie University. Students were broken into two groups and asked to answer questions. Group one was able to observe the physical object; group two was able to observe a 2D image of each object on a PowerPoint presentation slide. Students were advised that session conveners could not discuss the objects with them; they were asked to think about each object and make an educated guess.

Participants from both groups were asked to answer the same questions:

- What do you think this object might be?
- What evidence or features of the object did you use to decide?
- Where would you expect to see this object?
- What sort of insight might this object give you about the environment and/or period of time it came/comes from?

These four questions were designed so that students would consider the object both in isolation and framed within a probable context linked to the student's previous experience (if any) or imagination (if not). An initial observation was that students with access to the physical object (as opposed to a digital image of the object) were more likely to establish the intended use of the object than those participants who merely observed the image – even though a scale was provided with each object image to give participants a concept of object scale. The physicality of object engagement cannot be readily reproduced by the digital surrogate used in this experiment.

In part two of the student observation, six weeks after the initial running of the projects, students that participated in the sessions were invited to answer an online survey that aimed to access knowledge retained from the initial engagement sessions.² Those students who initially had access to the physical object were more likely to retain knowledge about it and respond to the online survey appropriately answering questions about the object again suggesting there are distinct pedagogic advantages in direct object engagement in comparison with digital surrogates.

Value/Need for the project

This project consisted of two related primary strategies. The first stage is complete, and it tested the value of object-based engagement with both real objects and digital surrogates in a controlled experiment with student volunteers to evaluate the retention of didactic information in the short and longer term. The second stage is in progress and has the aim of mapping the unit content of selected people and planet units against content in three Macquarie collections with a view to the development of object-based narratives in support of unit learning outcomes. The conjunction of these two strategies will establish the impact and viability of cross-disciplinary uses of objects in teaching programs.

² Powered by surveymonkey.com.

Macquarie has a range of museums and collections, many of which were established to underpin learning and teaching programs in a number of specific academic disciplines as in most other universities. The following three collections (linked to project team individuals) will be used for the second part of the project where collections are mapped against unit content in selected people and planet units.

The Biological Sciences Museum (Faculty of Science) is currently under redevelopment. It has permanent collections that may be used through exhibition spaces and/or digital media. The refurbishment of teaching labs has created new exhibition spaces providing additional opportunities for student engagement with collection specimens (ESTRADA-AREVALO ET AL. 2011). The Australian History Museum (Faculty of Arts) has an extensive collection of documents and artifacts originally developed to support teaching programs within the Department of Modern History. The museum has a management committee with distinct interests in the deployment of collection items within academic programs. The university art collection (Office of Institutional Advancement) is a university facility outside the faculty structure. There is a continuous program of exhibitions including ones undertaken with departmental/faculty partners. No analysis of the contribution to learning and teaching has been undertaken previously. The content of the university's art collection is not broadly known among academic staff and the potential for images from the collection to contribute to learning and teaching programs is unexplored. These collections were selected primarily because they represent a science faculty collection, an arts faculty collection and a central university collection with potential for linkages broadly across academic disciplines. In this way the project mirrors the aspirations of the 'people and planet' curriculum strategy at Macquarie University.

The mapping of these objects to units is proving difficult due to the varied and unintegrated nature of the collection management solutions each collection uses. The three collections used in this study use three different systems. Although in the second half of this year a project has been funded to find a solution that will suit all collections on this campus, this is not a quick fix and it will be some time (assuming further funding is available) before the varied collections are searchable in a manner conducive to locating object links to curriculum.

Despite the difficulties, it is a line that must be pursued as the project contributes to the university's faculties/departments in the following areas:

- Learning outcomes, graduate capabilities – through enhanced student engagement;
- Curriculum renewal and inter-disciplinarity – through greater engagement of academic staff with museum collections;
- Teaching and learning spaces – through incorporating exhibition spaces into learning and teaching plans.

But, more specifically, the research that underpins the progress of this project directly contributes to the scholarship of learning and teaching. While there are examples of cross-disciplinary object based pedagogies in the literature these tend to be program specific rather than institutionally focused and based on qualitative rather than empirical data. One of the few institutions to develop an institution-wide object-based learning strategy is the University College London. It has been estimated that over 100 course units use object-based learning (DUHS 2010).

We believe that the methodologies developed in this project could have much broader application both within Australia and internationally. Obviously this has the potential to increase the understanding of the value of the collections on campus to the broader academic community for learning, teaching and research outcomes. Significantly, the value to teaching using objects should be integrated into the strategies of any tertiary education institution that holds material collections.

Final thoughts

The lack of an over-arching database search engine for the collections used in this study has severely hindered progress. There are preliminary steps to address this issue, but a date for this is not secure – and when it is available, the timeframe to upload current database information into a useable format for each collection will be time consuming.

It appears to be an accepted notion that students today are more visually literate than previous generations. Certainly they are bombarded with a constant stream of imagery via the internet. However, it could be argued and certainly preliminary results from testing suggest this, that instead of focusing on details and critically accessing an image, it is being skimmed and details are overlooked. Details that in the case of this study could have assisted the visual student groups make a more educated guess at the function of an object.

While it is possible to integrate physical exposure to objects for internal students, external students are disadvantaged. This is an area that should be focused on, especially as higher percentages of students undertake study over distance.

Strategies to re-engage students perhaps similarly but on a smaller scale to museum/distance student programs such as the Australian Museum's 'museum-in-a-box' program may be of use – though this may prove cost prohibitive; and logistically difficult if large numbers of students are enrolled in a set unit.

Ancient history and the Museum of Ancient Cultures are attempting to address the issue with the use of 3D scanning of objects. This is still in its early stages as they learn to drive the software. Currently it is a slow process. If it proves beneficial to student experience, more funding will be needed to utilize this technology for larger portions of the collection. But, will this actually deal with issues of poor visual literacy skills? If the issue is 'image fatigue' will simply having the object available in a new format be any more advantageous to the average fatigued student? Introductory instruction on visual literacy skills may be important for some units of study. However, perhaps it is time for teaching staff to consider the value of object literacy as a separate issue from the value of visual literacy.

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Interpreting indigenous art in university collections

LINDA TYLER

Abstract

Debates on the representation of indigenous cultures in museums have come to the fore in the past thirty years. This paper examines the context for the opening of Waipapa Marae at the University of Auckland in 1988. It outlines a history of Māori meeting houses used for teaching and learning in a specifically Māori context in the New Zealand tertiary sector. The challenge for the university curator with a marae as part of the collection is how to interpret it for the 21st century. Facilitating a student-led process can make present those who have been traditionally absent in ethnographic exhibitions – the culture group who produced the objects.

Introduction: The New Zealand context

Article 2 of the Treaty of Waitangi, signed in 1840, has implications for all New Zealanders, but especially for university curators (MURPHY 1999). Under its provisions, Māori kept possession of their taonga or treasures, including art and architecture, after colonization. Since 1990, when the sesquicentennial of the Treaty was commemorated, representational control of taonga by iwi (Māori people) has become accepted practice in museums and galleries, including those in universities. Māori people as tangata whenua (people of the land) have asserted their right to decide what, when, why and how of taonga display and interpretation. All university collections in Aotearoa contain taonga, and five of the eight universities have marae with associated whare whakairo or carved meeting houses. Working with Māori to develop conservation and interpretation strategies for taonga on campus is increasingly a priority for New Zealand university curators. These initiatives are taking place in a difficult funding environment but one in which universities themselves have made the commitment to grow Māori enrolments in undergraduate and postgraduate programmes as part of strategic planning.

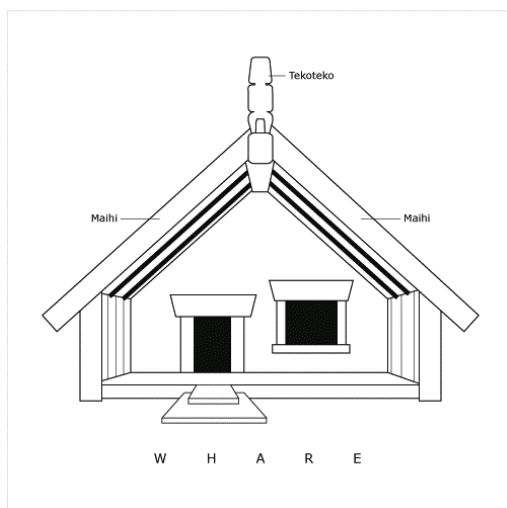


Fig. 1 - Author's adaptation of Terrence Barrow's diagram of a traditional meeting house façade. The porch is termed the roro (brain), the door is the kuwaha or mouth, and the window is the eye (matapihi). Inside the house is the womb (koopu), a sacred place, necessitating the removal of footwear before entering.

Symbolism of the whare whakairo

As momentum for indigenous rights grew in Aotearoa throughout the 1970s and 1980s, several university marae were built to enhance the campus environment and provide opportunities for teaching and learning, as well as to provide a place for welcoming visitors. Many Māori writers have argued that the marae is the one institution where other ethnic groups including Europeans can meet the Māori on Māori terms. It is therefore key to understanding what it means to be a bicultural society. The word marae refers to a meeting area in general. The full name is Te Maraenui-atea-o-Tumatauenga meaning the larger marae of Tumatauenga, God of War. Coming onto a marae involves being challenged before being welcomed into the meetinghouse or wharenuī (literally, big house). This main building represents the ancestor for whom it is named symbolically. The head is the koruru with a tekoteko (carved figure) at the apex of the roof, the arms are maihi or bargeboards reaching down to the

ground at the front. The spine is the tahuhu or taahu (the ridge pole down the centre inside and ribs areheke (rafters), often patterned with kowhaiwhai (swirling designs based on nature) reaching from the tahuhu to the poupou (carved figures around the walls). Ancestors from other tribes feature on each poupou and there are usually two uprights that support the tahuhu, representing the connection between Rangi, the sky father and Papatūānuku, the earth mother (BARROW 1976).

Teachers' College marae building in the 1970s

Teacher training colleges initiated the building of marae in the 1970s. The earliest of these is Te Kupenga o Te Matauranga (The Net of Knowledge) built for Palmerston North Teachers' College in 1979, and acquired by Massey University in a merger that took place in 1996.

Unlike most building projects which are part of the planning process at institutions of higher learning, the building of Te Kupenga o Te Matauranga resulted from more ad hoc funding. Rather than an allocation being set aside from the capital works budget, Te Kupenga o Te Mātauranga was paid for by the students' association funds and monies contributed directly from the principal's discretionary budget. This suggests that it was the result of successfully lobbying by both students and staff rather than being part of the institution's annual plan. Its decorative scheme was reliant on community expertise as well as project management by a key Māori staff. The house has extensive kowhaiwhai patterning on the interior (painted panels with Māori motifs based on the koru, a design derived from the shape of an unfurling fern frond in the forest) and also features carving and weaving, the former carried out by males, and the latter, reliant on the skills of women. This gender division of labor is customary, and the forms of decoration considered equally important and complementary.

The current use of Te Kupenga o Te Matauranga is typical for a marae on a university campus being used to welcome groups of staff and students as well as to teach aspects of tikanga (Māori protocol). Interpretation of its iconography is limited to a thirteen page booklet outlining the history of the building published in 1990 (TE KUPENGA O TE MATAURANGA 1990) and available in the Massey University Library.

The entire structure of Te Kupenga o Te Matauranga was built and decorated in one year under the direction of Cliff Whiting who was a lecturer at Palmerston North Teachers' College at that time. During his years at Palmerston North, Whiting introduced the concept of student marae visits. Born in 1936 on the East Cape at Te Kaha, Whiting is of the Te Whānau-ā-Apanui tribe. His work in Palmerston North in the 1970s was the first of several marae he would work on in the ensuing decades, culminating in the impressively colorful Te Honoki Hawaiki at the Museum of New Zealand Te Papa Tongarewa which opened in 1998.

Tūtahi Tonu at Auckland Teachers' College followed the marae at Palmerston North Teachers' College in 1983. It was carved by Mark Klaricich in two years and the whole facility was incorporated into the University of Auckland with amalgamation on 1 September 2004. Using the expertise of photographers in the university's centre for academic development, digital photographs of this marae were taken in 2006 so that a digital tour of the building could be made available online.¹ This development foreshadows later use of digital technologies, including Web 2.0, to enable students at the University of Auckland to learn more about the Maori art on the campuses.

The third marae built as part of a tertiary institution in New Zealand was also in the North Island and part of a teacher training facility. Waikato's Te Kohinga Marama was built as part of Hamilton Teachers' College in 1987. The polytechnic sector which also wished to attract greater enrolments of Māori began to build marae in the 1980s as well. Te Kuratini which is now part of the Massey

¹ www.education.auckland.ac.nz/uoa/home/about/facilities/marae-facility (accessed December 12, 2011).

University campus in Wellington was built under the auspices of Wellington Polytechnic. After becoming part of Massey University in 1999, it has continued to be used for performing arts, community gatherings, educational conferences and accommodation for students visiting Wellington.

The intention behind these marae building initiatives as part of teacher training and polytechnic campuses was to attract more Māori students to study to become teachers and also to pursue trade qualifications. Marae were part of an initiative aimed at the recruitment and retention of Māori in higher education which is ongoing. Currently 22% of state school students are Maori, compared with 10% of teachers (MINISTRY OF EDUCATION 2008).

University marae building in the 1980s and 1990s

Only 6.8% of undergraduates at New Zealand universities are Māori despite being 15% of the population so the imperative in the last thirty years has been to change the university environment, both physically and culturally, to encourage participation in higher education where Māori are underrepresented (MINISTRY OF EDUCATION 2008). Alongside the teacher training college and polytechnic sector initiatives discussed above, two universities (the University of Auckland and Victoria University) were involved with marae building projects in the 1980s with a third, the Auckland University of Technology, New Zealand's newest university, building Ngā Wai o Horotiu marae on its inner city campus in 1997 with Te Pūrengi the name given to the carved meeting house at the marae's centre.

At Victoria University, Te Herenga Waka was moved further up Kelburn Parade from Sir Kingi Ihaka's house to become the university's marae in 1984. After refurbishment, it reopened on 6 December 1986. The reconditioning project was an all-inclusive one involving all members of staff as well as the students who were enrolled at that time. As a junior lecturer in the art history department in 1986, I was given lengths of stripped fiber from the kiekie plant (*Freycinetia banksii*) to take to the wharenuī to tie in a pattern to make the tukutuku weaving panels under the supervision of a kuia (senior Māori woman) weaver Con Te Rata Jones.

All the marae discussed above are on campuses at North Island institutions. Neither Canterbury University in Christchurch nor Otago University in Dunedin have marae, nor does Lincoln University near Christchurch (originally an agricultural college). A Christchurch city facility, Rehua Marae in Springfield Road, which was built in 1960 as part of a trade training hostel for Māori workers brought down from the North Island, is used by the universities in Canterbury. Lincoln, Canterbury and Otago are all in the South Island which has a lower Māori population than the north but their lack of marae facilities is surprising given that they are ruled by the same governmental imperative to ensure better rates of recruitment and retention of Māori staff and students. Again, the polytechnic sector has been faster to respond than the universities: Christchurch Polytechnic Institute of Technology (CPIT) opened Te Mātauranga Māori in 1995. A website dedicated to Te Puna Wānaka (as it is now called) emphasizes the importance of Maori facilities for students, local iwi (tribal group) Ngai Tahu, and Pasifika (Pacific Island) communities: "it has reinforced our belief that we are the most accessible tertiary institution for Māori in Christchurch"².

The importance of the wharenuī Tane-nui-a Rangi at the University of Auckland

Marae, with their carved meeting houses or wharenuī, are living art works which have become a vital part of the physical and spiritual environment of many tertiary institutions in Aotearoa/New Zealand in the last thirty years. The University of Auckland is New Zealand's largest university with 40,000 students spread over five campus locations. Auckland, with its population of 1.3 million people, is the

² www.cpit.ac.nz/explore-cpit/our-schools/te-puna-wanaka/te-puna-wanaka-a-special-place (accessed December 12, 2011).

world's largest Polynesian city, and the university was the first in the country to build a Fale Pasifika (Polynesian meeting house) adjacent to its marae. The University of Auckland has almost 2000 Māori students on campus and about 50 Māori teaching staff. At the centre of Māori education at the university is the *whare whakairo* which is part of Waipapa marae, Tane-nui-a-Rangi. It opened on the city campus on 20 February 1988 and celebrated its twentieth anniversary in 2008. The Tuakana programme at the Faculty of Arts which targets outstanding Māori students and provides internship opportunities to develop their talents, has been the means by which interpretation of the soon-to-be 25 year old Waipapa marae (as it is known) has been brought into the twenty-first century.

Built in 1988, according to traditional methods, Waipapa marae had strong institutional funding support from the outset. Maori studies lecturer Dr Pakariki Harrison (1928-2008) of the Ngāti Porou iwi was the *tohunga whakairo*, (chief carver) and his wife Hinemoa of Ngāpuhi designed and supervised the execution of the *tukutuku* weavings for the interior. John Hovell of Ngāti Whanaunga and Ngāpuhi designed and painted the rafters with *kōwhaiwhai* patterns (MUTU 2008). Tane-nui-a-Rangi has come to be considered the most outstanding of all the university *whareniui* in terms of its artistic quality. Additionally, the status of the master carver and designer involved make it one of Aotearoa/New Zealand's greatest *taonga*. Pakariki Harrison is the subject of a full length biography (WALKER 2008) and John Hovell's *kōwhaiwhai* work for Tane-nui-a-rangi has been acclaimed in an award-winning study of his practice (SKINNER 2010).



Fig. 2 - Tane-nui-a-Rangi from Waipapa Marae at the University of Auckland showing clothing, including shoes, discarded by students before entering. Photo: L. Tyler

Interpretation of the whareniui in the 21st century

The recent introduction of the Tuākana programme at the University of Auckland provided the opportunity for outstanding young Māori achievers to work with the university's art gallery staff to realize projects which utilize new technologies in order to interpret and conserve Māori art and architecture in the university's collection. A YouTube video was made in 2008 to record the exterior of the building.³ Coinciding with the 20th anniversary of the *whare whakairo* (carved meeting house) on

Waipapa Marae in 2008, a revised edition of the original booklet explaining the symbolism of the meeting house was published with a preface by Professor Margaret Mutu (MUTU 2008). This has been followed by the Tuākana Arts seminar series in 2011 where a seminar on the history of Waipapa Marae was given by Professor Mutu on the Marae on 27 July 2011. In development for 2013 which will be the jubilee of Waipapa Marae (its 25th anniversary) are interpretation programmes which will link the marae buildings, their carvings and history with other media through QR (Quick Response Codes) allowing links to moving images, music, dance and information. This use of new media has derived from focus groups aimed at connecting students with *taonga* (art treasures) by asking them how they would like to see them interpreted. Instead of the university art museum voice speaking on behalf of Māori, the intention is for students to use the art museum's resources to develop their own interpretation of the sites and objects in them.

³ www.youtube.com/watch?v=f1GsCf6Fzkg (accessed December 12, 2011).

Under the Treaty of Waitangi, Māori retain possession and enjoyment of their taonga, and the university's role is one of kaitiaki or guardian rather than owner of Waipapa Marae and its meeting house, Tane-nui-a-rangi. Central to this endeavour is an acknowledgement of the mauri or living life force of the taonga. Māori do not see art which was created in the past as an historical relic but rather as something living in a present which has a future. Therefore it is appropriate to envisage a digital future for taonga since they act as a repository of connections and embody a living tradition that brings the past down into the present. Rather than being inanimate objects, their energy and significance can be conveyed using digital tools deployed by a new generation of Māori students.

By handing the power over to the culture which produced the taonga, the curator facilitates the presentation of Māori art in the best conditions and environment culturally. When artifacts become living taonga or treasures in this way, the people who made them gain mana or prestige along with the viewers who interact with them in the university environment. The imperative for university curators working with collections which include wharehau and marae is to employ Māori understandings of taonga as social agents. This has wider implications for curators working with ethnographic exhibitions and collections elsewhere in the academic and cultural collections. The time has come to make present those who are absent from ethnographic exhibitions – the living descendants of those who created the exhibited objects. Ultimately this requires changing from speaking with an authoritative voice about art objects in the collection to facilitating a process for their interpretation.

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Complutense Art Centre. A new space for the heritage and the contemporary art in the Complutense University of Madrid

ALEJANDRA GÓMEZ MARTÍN

Abstract

Complutense Art Centre (c art c) is located in the centre of the University City. In 2009, it began with a new room of temporary exhibitions approximately 400m² for showing contemporary artists and the heritage of the university. In a second phase, 700m² will be adapted in a permanent exhibition space. The aim is to show a selection of the most emblematic works of our heritage.

Complutense Art Centre

Complutense Art Centre (c art c) wants to be a place where the heritage and contemporary art live together; a place where people know about the sciences, the arts and the history. We support exhibitions of contemporary art exhibitions and product of research of our patrimony. The museums of the university, besides preserving heritage, represent the history of the institution. They must bear



Fig. 1 - Logo Complutense Art Centre, Madrid

identity signs that relate the past to the present. It is possible to form this idea across the creation of a common space where the different collections coexist and are visible in a permanent exhibition by means of the selection of the most significant works of art. In addition, the university museums can study in depth their collections with the production of temporary exhibitions.

The university

The Complutense University of Madrid (UCM) is a quality public university in the service of society. Along with the Polytechnic University of Madrid since 2009, the Moncloa Campus is recognized as *Campus of International Excellence*, a project "international reference in research, training and innovation". University City was declared a cultural heritage in 1999, with the category of historical site, by the community of Madrid, in recognition of its architectural, landscape, nature and heritage as home to the cultural legacy of the ancient university founded by Cardinal Cisneros in Alcalá de Henares in 1499.

The aforementioned requires keeping up with this reality through the innovative project, still in the process, which I will explain below: Complutense Art Centre.

The place

The Complutense Art Centre, which opened in October 2009, is located in the heart of the University City of Madrid, in the district of Moncloa. As an example of coexistence of institutions, it is on the ground floor of the current *Costume Museum / Research Center of Ethnography Heritage*, a national museum of the Ministry of Culture. The building, which opened in 1975 as a Spanish Museum of contemporary art, is the work of architects Jaime Lopez de Asiain and Ángel Díaz Domínguez, who followed the design specifications of the Congress of Museum Architecture of 1968. The project was the National Architecture Prize in 1969.

The land, on which the Costume Museum stands, was ceded by the Complutense University for 50 years to the Ministry of Culture. Approaching the expiration date of such assignment and seeing that

the economic crisis paralyzes any alteration, Complutense University has opted for cohabitation and temporary assignment spaces.

The location of Complutense Art Centre means that most of our audience is from the university.

However, we receive public who visit the Costume Museum as well as external audiences who are attracted by our activities and exhibitions; this is a big advantage!

Objectives

One of our goals is to combine different types of adult audiences, whether student or outsider audiences. In this effort to join diverse audiences, we are concerned in having visibility, not only on the web UCM with its own site *c art c*,¹ but also in social networks like Facebook² and Twitter³, with a following of almost 1,000 followers.

The Complutense University of Madrid has got a considerable cultural heritage, a testimony of its long academic career and social life. This heritage is characterized by its variety and spread in different museums and offices. The offices especially are creating problems in terms of conservation, inventory, custody and dissemination.

For this reason, another goal is to show this important historical heritage of the UCM, which composes the series of cultural works of art accumulated throughout history. To this end, we believe in the Art Centre as a symbol of identity, where you can display the historical and artistic heritage as well as it is being a dynamic focus on new artistic trends and an artistic forum of culture and social integration. When we started on the path, we set the following objectives:

- To have an international projection;
- To be a place of innovation in the arts, cultural integration and the promotion of relations between the Complutense University and Madrid city;
- To integrate the 12 museums and the 18 art-historical and scientific-technique collections in a single exhibition display;⁴
- To show the art treasures in museums and collections as a Complutense historical reference;
- To get citizen participation, students, professors, etc.;
- To integrate the university community;
- To collaborate between universities with exhibitions and the creation of coproduced projects.

The lines that define our exhibitions are supported by the emerging art of young artists, the commitment to be a reference centre of the best contemporary art, as well as belief in the richness of our heritage and museums as an undisputed content of our exhibition projects. Moreover, we want to give a special boost to complementary activities whereby visitors can debate, research and participate.

Phases

In October 2009, first phase of *c art c* was completed with the opening of the temporary exhibition space. The second phase is in process. It will be a space where there will be a permanent exhibition of the heritage of university, selecting the most relevant works of art from the museums and collections. A third phase would close a more comprehensive site: warehouses, offices and an auditorium. These phases depend on the solution of economic difficulties.

¹ www.ucm.es/info/memorias/culturaydeporte/c_arte_c/c/%20arte%20c%20nueva/index.htm (accessed November 14, 2011).

² es-es.facebook.com/pages/c-arte-c-Centro-Arte-Complutense/221493565399 (accessed December 11, 2011).

³ twitter.com/c_arte_c (accessed December 11, 2011).

⁴ portal.ucm.es/web/museos (accessed December 11, 2011).

Nowadays, the description of the *c art c* could be: a space, on the ground floor of the Costume Museum, consists of two exhibition rooms. The first one, 400m², has all the advances to develop exhibitions of all kinds: air conditioning, mobile walls, multimedia, lighting, furniture, warehouse, etc. The second of the art exhibition room, or 'Anexo' *c art c*, 700m² still undeveloped, is used for activities such as conferences, concerts, exhibitions, experimental workshop, etc.

The management

The management of *c art c* is overseen by the Vice Chancellor of Attention to the University Community, who ensures that the departments of economic, museums, graphic design and web publications work together.

The technical team of *c art c* consists of the Vice Chancellor of Attention to the University Community, the chief of the technical culture unit, the person in charge of institutional relations, the exhibition designer and coordinator, the graphic designer and the staff of the museum area.

There is an annual budget complemented by specific sponsors and contributions which make possible the development of exhibitions and other cultural activities.

The selection of projects is done in two ways: internally and through an expert commission. The first is decided by the Vice Chancellor of Attention to the University Community to consider the suitability of the exhibition project or activity.

The other route selection is shaped by the expert commission. *c art c* has a 'prize' called *Proposals c art c* for the production of exhibition projects. This provides a fixed budget for the implementation of these projects. Throughout the year we receive different projects that are selected by the committee. They are curators and critics. We are working on a new 'prize' for space *Anexo c art c* to select other activities.



Fig. 2 - Empty temporary exhibition room in the Complutense Art Centre



Fig. 3 - Exhibition *Black. Central African Art*

Exhibitions

Since 2009 there have been many outstanding exhibitions which I will try to group together. I will remark the most important aspects about them.

- About exhibitions of Complutense heritage:
Black. Central African Art: there were concerts, conferences and guided visits; complementary activities which complemented the exhibition. It will be the next donation to the university thanks to some good management. We got to show the collection in two itinerant exhibitions

more. Students of conservation cleaned the works of art. The curator and the collector was a professor of our university.

- About exhibitions of contemporary art:

Guillermo Llobet: it was a support to a young artist and his interesting project. This exhibition has gone to other universities.

Videoart made in Spain: we receive an itinerant exhibition from another university and it was complemented by meetings with the artists.

Art Barter: traded along with Spanish artists share their works novice designers by allowing them to offer visitors. People could offer anything but no money.

Digital Art Meeting. Multimedia installation complemented by a prize to young artists. The curator was a professor of our university, too.

AENA Collection: an excellent collection of contemporary art.

Paloma Navares: winner of *Proposals c art c*.

Alex Francés: winner of *Proposals c art c*.

Mira Bernabeu: winner of *Proposals c art c*.

The Nature Spirit. Contemporary Japanese Textile Art.



Fig. 4 - Exhibition *The Nature Spirit. Contemporary Japanese Textile Art*

- About young university artists:

Intransit: it is a platform created by the Complutense University of Madrid that advocates establishing professional standards of work between the artistic community college and cultural players operating in each sector.

Stand By: final exhibition of fine arts students.

Furthermore, no less interesting, we are going to do two exhibitions in 2012 that combine modernity and artistic Complutense heritage:

- *The Computer Centre at the University of Madrid (1968–1982). From numerical calculation to the interdisciplinary creativity*. It produced a journal, a publication and other activities. It created areas of cooperation relations between science, technology, arts, education and thought. It formed, for the first time in Spain, after many years, interdisciplinary research groups.
- The exhibition about the representation of animals yesterday and today is a project promoted by the group and Nature Art-Science Faculty of Fine Arts: a research on the links and differences between the models of scientific representation of animals belonging to the funds of the Complutense University and new formulations of art in this century.

Finally, as a reflection, I would like to express the need to give visibility to the university heritage in a joint and centralized space. This does not mean we should neglect the university museums or ignore the presence of heritage in the offices, but we saw the opportunity and desirability of developing a project in which contemporary art converge with the spread of heritage of the university. This is our identity.

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Recent recommendations by the German Council of Science and Humanities on scientific collections as research infrastructures. A report

CORNELIA WEBER

Abstract

The German Council of Science and Humanities provides advice to the German government and states on the structure and development of higher education and research. In January 2011, the Council presented recommendations on scientific collections as research infrastructures. This article summarizes the results of the proposal and their implications on university museums and collections.

Introduction

In January 2011, the German Council of Science and Humanities, which provides advice to the German government and states on the structure and development of higher education and research, presented recommendations on scientific collections as research infrastructures.¹

In this article, I will summarize the recommendations and their implications on university museums and collections. I will begin by providing a brief overview of the situation and recent developments of university collections in Germany, which have undoubtedly contributed to the recent accomplished evaluation.

The situation of university collections in Germany

In 2001, after detailed inquiries on the collections of Humboldt University of Berlin leading to the exhibition "Theatre of Nature and Art. Treasure-Trove of Knowledge",² I realized that an overview of collections existing in German universities had not been done before. This observation led to a research project on the holdings and history of university collections in Germany. In 2004, the German Research Foundation (DFG) accepted the application and awarded the project five-year funding. Simultaneously, I tried to increase the visibility of university museums through presentations, publications, and advocacy (e.g. WEBER 2009, 2010).

In 2009, when the working group on research infrastructures for scientific collections set up by the German Council of Science and Humanities started to look at scientific collections, it could rely on a database for university collections with more than 1,000 entries, whereof more than one-third were already dissolved, no longer existing at the original university, of unknown destiny, or orphaned.³

In 2010, the Helmholtz Center for the Kulturtechniken organized for the first time a conference in Germany addressing people working in and with university collections.⁴

The symposium, called *University Museums and Collections in Academic Practice. Tasks – Concepts – Perspectives*, aimed at:

- identifying new tasks for university museums and collections, and developing strategies to guarantee their continued existence. The meeting also set itself the task of framing future-oriented concepts to allow for a fuller integration of traditional university collections into

¹ Wissenschaftsrat: Recommendations on Scientific Collections as Research Infrastructures. [Empfehlungen zu wissenschaftlichen Sammlungen als Forschungsinfrastruktur.]. Drs. 10464-11. Berlin 28 January 2011. www.wissenschaftsrat.de/download/archiv/10464-11-11_engl.pdf, www.wissenschaftsrat.de/download/archiv/10464-11-11_engl.pdf (accessed September 5, 2011).

² www2.hu-berlin.de/hzk/theatrum/englisch/index.html (accessed September 5, 2011).

³ www.universitaetssammlungen.de/ (accessed September 5, 2011).

⁴ universitaetsmuseen.hu-berlin.de/ (accessed September 5, 2011).

established academic practice while taking into account the current requirements of teaching, research and science communication;

- establishing a network for university museums and collections in German-speaking countries in order to provide a platform for the urgently needed exchange of experience and knowledge. Such an initiative allows the critical formulation, reflection, and realization of joint strategies, partnerships, and collective activities.

The academic response to the symposium was overwhelmingly positive. For the first time in Germany, 150 academics and decision-makers from various fields talked on university museums and collections from an interdisciplinary perspective, among them members of the working group set up by the German Council of Science and Humanities. Discussion topics addressed as many aspects of collection management and development as possible. They included reflections on the position of academic museums and collections, collections handling, the role of collections in teaching, research and science communication, and the discussion of future-oriented strategies. The proceedings are freely available on the web.⁵

One of the symposium's most important results was the consensus to continue the work initiated in Berlin and to establish a network not only to develop supra-regional concepts and strategies, but also to play a more active part in shaping academic and cultural policies.

Recommendations

In the past, the Council's attention focused mainly on collections outside of universities. This time, the working group included also the many academic scientific collections. Especially at universities, collections play an important role as infrastructure for research and teaching. As a result of the evaluation the Council saw a need for action particularly with regard to university collections.

The Council's conclusion that "scientific collections and objects form an essential basis for research in numerous scientific disciplines" and that "the potential of scientific collections for research should be utilized more effectively in the interests of the scientific system, and also in search for answers to current questions with urgent relevance for society as a whole"⁶ has resulted in the following recommendations:⁷

- "It is fundamentally important to determine the status of the scientific collections."
- "Universities should assign responsibility for the collections to persons who will adopt a comprehensive perspective."
- "The status determination should be used as a starting point for the further systematic conceptual development of the collections."
- The "decentralized structure requires a certain degree of interdisciplinary, self-organized networking and coordination between the collections. The Council therefore recommends that the German federal government should fund, for the medium term, a body that performs corresponding advisory and coordination activities."
- "Guidelines and standards are required for the documentation, (digital) indexing, management, upkeep and conservation of collections."
- "The Council recommends the (further) development of appropriate financing options and funding instruments for scientific collections."

⁵ [edoc-hu-berlin.de/conferences/ums2010](http://edoc.hu-berlin.de/conferences/ums2010) (accessed September 5, 2011).

⁶ Recommendations p. 7.

⁷ Recommendations p. 7-8.

Outcomes

As one can imagine, the university museums and collections' community is significantly encouraged by these recommendations. At the second nationwide conference in Jena in April 2011,⁸ the discussion of the Council's proposals, people generated enormous enthusiasm.

Apart from the fact that people responsible for collections are expected to demonstrate a high degree of personal initiative and self-organization, in principle the recommendations address four different agents:

1. Collections
2. Universities
3. Government
4. External capital providers

1. Collections: As a starting point, the current state of collections needs to be clearly determined, in other words they should be documented and classified in terms of quality. Only this information can provide a realistic assessment of their worth for the further systematic conceptual development and the possibility of being a part of a given network. Proper assessment criteria are urgently needed. Learning to recognize and rate the value of collections as scientific infrastructure before developing adequate future concepts and strategies is of utmost importance.

2. Universities: Every university holding collections has to establish working committees which meet regularly. Furthermore, the appointment of a collections officer to develop a comprehensive inventory of the university's collection, build a network between individual collections, support the links between research, teaching and exhibition, and initiate external relationships, is essential.

This person should have a close connection to the rector's or president's office. Together with the working committee the collections officer should develop a guidance framework for a university-wide policy in order to improve the status of individual collections, which in turn should be integrated into a university-wide collection policy. In the last months, several German universities already initiated specific initiatives in this direction.⁹

3. Government: To support collections and universities and to facilitate a nationwide network, a national coordination body funded by the government is needed. This office will – in the long term – include also non-university scientific collections.

4. External capital providers: Without additional financial support from external sources such as the German Research Foundation and the VolkswagenFoundation, among others, it will be difficult for most collections to achieve any remarkable improvements. Therefore, particular funding agencies are asked to develop appropriate project funding instruments.

Tasks of the coordination body

One of the most interesting and challenging tasks is to create the coordination body mentioned above. It seems that this undertaking is unique in the world of university collections. There is no model that can be adopted and the German community needs to start from scratch. Among some of the objectives such a structure should have, I would underline the following:

⁸ Selbstorganisation und Förderung von wissenschaftlichen Sammlungen. Die Empfehlung des Wissenschaftsrates [*Self-organization and promotion of scientific collections. The recommendations of the Council of Science and Humanities*], www.conventus.de/index.php?id=4466 (accessed September 5, 2011).

⁹ For example, the University of Nuremberg-Erlangen and the Humboldt University of Berlin appointed a collections officer; the University of Hamburg and the University of Kiel established special working committees.

1. To set up a platform for communication (website, blog, forum, wiki) in order to make available relevant data and allow the exchange of information for the community to increase the network.
2. To develop a nationwide meta-database portal with regard to the interdisciplinary nature of collections, different shareholder institutions and their relevance for research today.
3. To support the development of criteria for the assessment of collections.
4. To develop guidelines and standards for the use of collections as research infrastructures (indexing, management, upkeep and conservation, accessibility, digitization).
5. To offer advisory service to the collections and universities.
6. To promote consultation between collections, coordinate and organize activities nationwide.

Final remarks

Since the first published report on *Cinderella Collections* in Australia in 1996¹⁰ some relevant reports and recommendations followed, e.g., the *Recommendation on the governance and management of university heritage* of the Council of Europe in 2005¹¹ or the report of the University Museums Group UK *University Museums in the United Kingdom: a national resource for the 21st century* in 2004¹². But all these statements never went so far as to propose such specific actions as the recommendations of the German Council. Therefore, the suggestions are not only relevant for German scientific university collections. On the contrary, other countries can incorporate the main proposal and profit from the advice and experience. However, first it is absolutely necessary to compile basic information on collections in order to raise awareness to this kind of research infrastructure and get activities started.

Some of the proposals mentioned before should not be realized only at national level. It is also possible to do it at international level. Therefore, I advise the International Committee of University Museums and Collections to seize this window of opportunity and to promote the procedure. UMAC could for instance develop criteria for the assessment of collections or elaborate certain standards on one of the next conferences. There are already basic approaches one can use, for example from non-university research collections. To support this initiative would be a rewarding and challenging task for UMAC.

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¹⁰ University Museums Review Committee of the AV-CC: *Cinderella collections. University museums and collections in Australia. The report of the University Museums Review Committee*. Canberra: Australian Vice-Chancellor's Committee 1996.

¹¹ Council of Europe 2005: *Recommendation Rec(2005)13 of the Committee of Ministers to member states on the governance and management of university heritage*. www.universeum.it/docs/RecommendationRec%282005%2913_EN.pdf (accessed January 4, 2012).

¹² umg.web.its.manchester.ac.uk/wp-content/uploads/2010/03/UMG_Advocacy.pdf (accessed January 4, 2012).

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The University of Lisbon's cultural heritage survey (2010–2011)

ANA MEHNERT PASCOAL, CATARINA TEIXEIRA & MARTA C. LOURENÇO

Abstract

In this paper, a survey of the cultural heritage of the University of Lisbon (2010–2011) will be presented, with a focus on the methodological approach. Main results will be discussed, as well as future perspectives regarding management, preservation and access of the university's scientific and artistic collections, and buildings of artistic, architectonic and historical significance.

Introduction

In the twentieth century, university museums and collections became increasingly complex institutions facing many challenges. During the post-war, particularly in Europe, three major factors had direct consequences in the mission and role played by university museums and collections. First, structural reforms in higher education systems had impact in the university internal structure, autonomy and governance. Secondly, a significant development of the museum sector, with the gradual implementation of accreditation systems, improved training and professional standards, with a significant increase of public access. Finally, advancements in science often had a profound impact in scientific research and teaching trends, deeply transforming the curricula of many courses.

These three factors posed major challenges to university museums and collections. Many suffered a considerable decrease in their use for teaching and research and became orphaned and vulnerable. Many others were shutdown. Since the 1980s, an extensive literature about the 'crisis' of university museums began to emerge.¹ Several surveys were initiated in different countries and, through the 1990s, collaboration both at national and international levels emerged, as professionals from both university museums and the museum sector mobilized for the preservation of university museums and collections.

Until the 1980s, comprehensive national surveys of university museums and collections were rare in Europe. The first took place in the Netherlands in the 1980s. After almost three decades of instability, neglect, department closures, reorganizations, and disposals of orphaned collections in several Dutch universities, keepers and curators created the LOCUC² (DE CLERCQ 2003). Sponsored by the Ministry of Culture, the LOCUC published a seminal report about the situation of Dutch academic heritage (LOCUC 1985); a second survey with a broader scope was commissioned by the Ministry for Education, Culture and Science (ADVIESGROUP RIJKSDIENTS BEELDENE KUNST 1996).

Since the 1960s in the United Kingdom, surveys and reports about higher education museums and collections have been published regularly (e.g. STANDING COMMISSION ON MUSEUMS AND GALLERIES 1968, 1976; MUSEUMS AND GALLERIES COMMISSION 1987; BENNETT ET AL. 1999; UNIVERSITY MUSEUMS GROUP 2004). However, detailed and systematic surveys, covering every region, were only conducted between 1984 and 2002 (BASS 1984a, 1984b; ARNOLD-FORSTER 1989, 1993, 1999; DRYSDALE 1990; ARNOLD-FORSTER & LA RUE 1993; ARNOLD-FORSTER & WEEKS 1999, 2000, 2001; COUNCIL OF MUSEUMS IN WALES 2002; NORTHERN IRELAND MUSEUMS COUNCIL 2002).

In other countries, such as France and Germany, national surveys are ongoing, often informal, processes. Germany initiated in 2001 a census of German university museums and collections, disseminated through the Internet.³ More recently, the German Council of Science and Humanities

¹ Cf. a review of the literature in LOURENÇO 2005.

² LOCUC stands for *Landelijk Overleg Contactfunctionarissen Universitaire Collecties* (Survey Group for University Collections).

³ Cf. www.universitaetssammlungen.de (accessed November 8, 2011).

published a report regarding university scientific collections, *Recommendations on Scientific Collections as Research Infrastructures* (2011).⁴ In an approach similar to Germany's, France is developing a national online platform for universities and other institutions of higher education (*Plateforme OCIM Universités*), coordinated by the OCIM, *Office de Coopération et d'Informations Muséales*.⁵ This platform aims at creating a collaborative network, for which a preliminary launch meeting took place in 2009, at the Universeum annual meeting in Toulouse. The network encompasses all French universities (SOUBIRAN ET AL. 2009; SOUBIRAN & BELAËN 2012).

In Italy, under the direction of the Italian Conference of Rectors (CRUI), a special 'Committee for university delegates for museums, archives and centres of historical and scientifically significant university collections' was created in 1999.⁶ The so-called *Commissione Musei* conducted a national survey of university museums and collections. Results are available online, although still far from representing the rich and diverse Italian university heritage.⁷

At international level, two organizations are worth mentioned as they have conducted formal or informal university museums surveys: the *Universeum* European Academic Heritage Network and UMAC. The latter has developed a remarkable Worldwide Database of University Museums & Collections,⁸ aimed at providing a global online directory, including information from other directories, inventories, catalogues and other sources (WEBER & LOURENÇO 2005).

At university level, surveys are more common than at national or international levels. In the past two decades, many universities in Europe have conducted surveys of their heritage. Typically, these surveys result from institutional reorganizations and the need to improve standards and long-term sustainability.

In Portugal, the public higher education system encompasses 16 universities and 31 polytechnic institutes, although the majority of university museums and collections are at the Universities of Lisbon, Coimbra and Porto. Despite recent efforts in reorganizing and raising the visibility of Portuguese academic heritage, particularly scientific (LOURENÇO 2010), no national survey has ever been done or is planned. At university level, Lisbon is the first to have completed a systematic and methodology-controlled survey of its cultural heritage.

The University of Lisbon

In 1290, a studium generale was created in Lisbon, where it functioned until the sixteenth century, except for two short periods of 30 years.⁹ In 1537, it was transferred to Coimbra (FERNANDES, in press). Higher education would only be re-established in Lisbon in the nineteenth century, with the creation of the Medical and Surgical School (1836), the Polytechnic School (1837) and the Higher Course of Humanities (1859). In 1911, these schools were united to form the faculties of medicine, sciences and humanities of the University of Lisbon, respectively. Therefore, the University of Lisbon celebrates in 2011 the centennial of its re-foundation. Studies about its museums, collections and buildings of artistic, historic and architectonic interest have been limited and fragmented (e.g. CALADO 2000; LOURENÇO & CARNEIRO 2009; PASCOAL 2012).

⁴ Cf. www.wissenschaftsrat.de/download/archiv/10464-11-11_engl.pdf (accessed November 8, 2011).

⁵ Cf. www.ocim.fr/spip.php?rubrique57 (accessed November 8, 2011).

⁶ Cf. www.cruil.it/HomePage.aspx?ref=891 (accessed November 8, 2011).

⁷ Outside Europe, two broad-scale surveys are worth mentioning: Australia, coordinated by Peter Stanbury (UNIVERSITY MUSEUMS REVIEW COMMITTEE 1996; UNIVERSITY MUSEUMS PROJECT COMMITTEE 1998) and the USA (DANILOV 1996).

⁸ Developed by Cornelia Weber, Humboldt University of Berlin, cf. publicus.culture.hu-berlin.de/collections/index.php?id=about (accessed November 8, 2011).

⁹ Between 1308–1338 and 1354–1377.

Today, the University has c. 23,000 students, eight faculties, nine institutes and two museums, distributed in five campuses (fig. 1). The main campus is *Cidade Universitária*, encompassing the Faculties of Medicine (and academic hospital), Sciences, Humanities, Law, Pharmacy, Psychology and Dental Medicine; the Institute of Social Sciences, the Institute of Education, the Institute of Geography and Territorial Planning; and the rectorate building. The Faculty of Fine Arts and the two museums – the Museum of Science and the National Museum of Natural History – are located in the centre of Lisbon (the so-called *Seventh Hill* quarter).¹⁰ The Câmara Pestana Bacteriological Institute and the Lisbon Astronomical Observatory have yet different locations in Lisbon, respectively *Campo de Santana* and *Tapada da Ajuda*. Finally, the Guia Marine Laboratory is located in Cascais.

The survey

The cultural heritage survey was integrated in the programme of the university's centennial commemorations. It was conducted between April 2010 and January 2011. Its methodological approach had been established in a preliminary survey developed in 2007,¹¹ which in turn had drawn from the Australian surveys coordinated by Peter Stanbury (UNIVERSITY MUSEUMS REVIEW COMMITTEE 1996; UNIVERSITY MUSEUMS PROJECT COMMITTEE 1998).

The centennial survey had three main objectives: first, to assemble objective and systematic information about the volume, location, disciplinary scope and present state of the cultural heritage held by the University of Lisbon; second, to have a better understanding of its role and significance for the university, the city and the country; finally, the survey aimed at creating a sound point of departure for a consistent long-term management, study, interpretation and accessibility of the collections, museums and buildings of significance of the university.

In methodological terms, the survey comprised field data collecting, oral interviews and bibliographic and archival research. The first stage consisted in identifying the various units and their locations; the data was uploaded into a database (April–May 2010). At the same time, bibliography, documents and iconography regarding the University of Lisbon were compiled. This compilation continued throughout the whole duration of the survey. Bibliographic and archival research focused especially on past collections and museums, both to trace their location today and to understand why they had been lost (LOURENÇO & TEIXEIRA 2011). This has often posed challenges as there are few studies available, let

alone published materials, and the sources are considerably dispersed among a dozen of different locations.

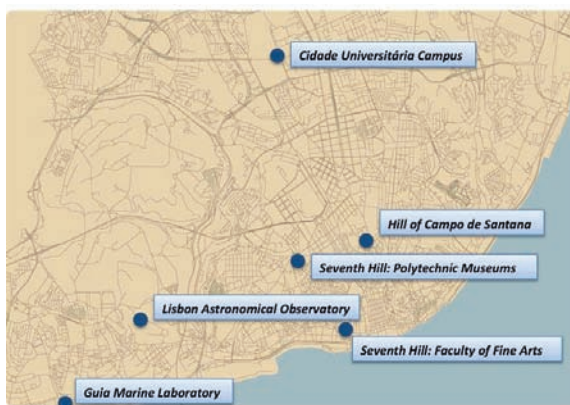


Fig. 1 - Geographical distribution of the University of Lisbon

Fieldwork took place between July 2010 and March 2011, often including multiple visits to the same department, faculty or institute (total 45). All visits included oral interviews and comprehensive image collecting. Multiple visits were mostly due to: a) volume and dispersal of collections, both through Lisbon and through the faculties and departments; b) a misunderstanding of the objectives of the survey, including what was meant by 'cultural heritage' and 'collections', requiring

¹⁰ The Museum of Science was created in 1985, although its planning dates back to the 1960s; the National Museum of Natural History has its origins in the eighteenth century royal natural history collections; the latter also includes the Botanical Garden.

¹¹ LOURENÇO, M. C. 2007. *O Património Histórico, Científico e Artístico da Universidade de Lisboa. Levantamento Preliminar. Parte I – Centro da Cidade e Observatório Astronómico de Lisboa*. Lisbon: Museum of Science of the University of Lisbon (did not cover the *Cidade Universitária* campus; unpublished, in Portuguese).

further explanation and contact. Additional challenges related to the fieldwork included: c) difficulty in identifying the person in charge of the collections, or absence of someone in charge, or even the complexity of defining 'in charge' in some cases; d) the difficulty to establish clear boundaries between individual and institutional collecting.

Given the diversity of the heritage, a working typology was considered essential. Initially, five categories were considered for survey – collection, museum, historical library, historical archive, and building – but these were later simplified to three – collection, object and building. This simplification had two main reasons. First, it is obvious that archives and libraries can be considered collections. Second, in universities, the use of the term 'museum' is often fluid, problematic and not necessarily in the ICOM sense; it is thus easier to consider the collection as the main unit – this can be organized in a museum or not. Although subject to several adaptations during the survey, the working definition of 'collection' used in the survey was: 'a set of objects with an internal and logical consistency, constituting both in themselves and as a whole material evidence of human or natural activity, deliberately reunited in a permanent or temporary way for a specific and previously established purpose'. In disciplinary terms, collections surveyed encompassed the sciences, arts and humanities.¹²

During the survey, each item was provided with an identification number and a brief designation. Data collected in the field included: number of artifacts and specimens, provenance, department and location, contact, legal and institutional background, history, relevance, use, catalogue and conservation state, documentation, staff and bibliography. There were also variations in data collected for each category (e.g. object requires information regarding title, author, category, date, dimensions and materials, and building requires data on architect/author, date, etc.). As mentioned above, a considerable number of photographs of each item were also taken.

Given the diversity of states of access, inventory/catalogue and conservation, a classification system for collections was considered useful. Five classes or categories were developed: a) Collection class I: Not catalogued and physically inaccessible; b) Collection class II: Not catalogued and physically accessible; c) Collection class III: Catalogued and physically accessible; d) Collection class IV: Catalogued, physically accessible and observing minimal conservation standards.¹³

Results

Results confirmed initial expectations suggested by the 2007 preliminary survey and similar university heritage surveys done elsewhere.¹⁴ First, the University of Lisbon has a limited view about the size, diversity and importance of the heritage held under its responsibility. This heritage, composed mostly of collections and buildings of historical significance, is highly dispersed, heterogeneous and has low visibility in the university. Second, although the university has two museums in the ICOM sense of term, the majority of the collections are in departments and institutes. These are partly teaching and research collections and partly historical collections. The latter is thus clearly vulnerable, subject to arbitrariness and lacking proper selection and curatorial staff.

The survey resulted in a total of 214 items; of these, 153 are collections, 37 are individual objects of cultural significance and 24 are buildings of historical, artistic and architectonic relevance. The majority of the university's cultural heritage is located in dispersed academic units, such as faculties, departments and institutes (60%), followed by the museums (33%) and the rectorate (7%) (fig. 2). Geographically, the university's heritage is also dispersed: 57% at *Cidade Universitária*, the main

¹² More often than not, collections surveyed were not considered 'collections' by the university (e.g. furniture, stained glass).

¹³ One would presume that in the two museums of the university most collections would be Class IV, but that was not the case.

¹⁴ LOURENÇO 2005.

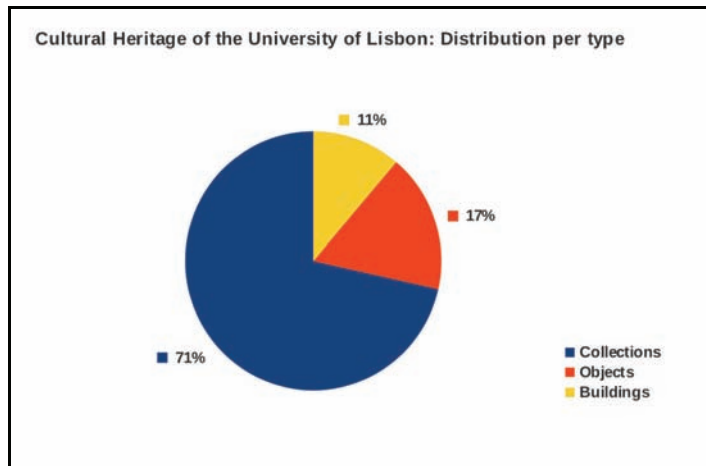


Fig. 2 - Distribution of the heritage per institutional type

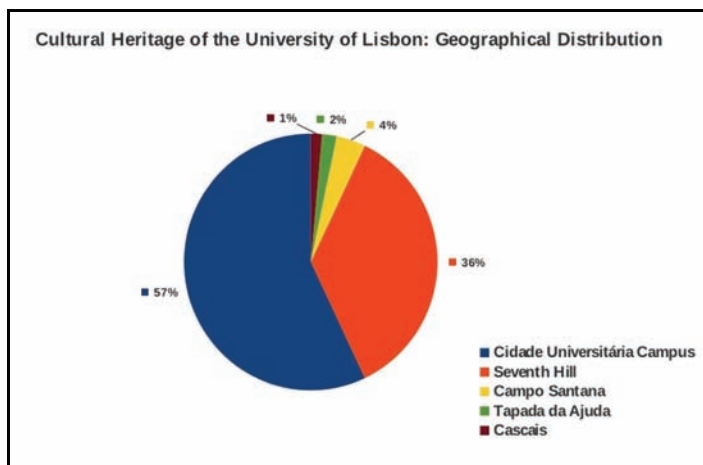


Fig. 3 - Distribution of the heritage per campus



Fig. 4 - The Astronomical Observatory of the Lisbon Polytechnic School at the Botanical Garden, nineteenth century. Photo: M. Heller, Ministère de la Recherche, Paris, University of Lisbon archives

campus; 36 % in the Seventh Hill; 4% at Campo Santana; 2% in Ajuda and 1% in Cascais (fig. 3).

Among its items of major relevance, the University of Lisbon has a national museum; a botanical garden recently classified as national monument; two historical astronomical observatories, a historical chemistry laboratory; a historical bacteriological laboratory; a historical convent and a historical fortress. Some of these have international significance.

The collections of the University of Lisbon encompass a broad range of disciplines, from medicine to natural history, physics, astronomy, archaeology, anthropology, sacred and contemporary art, chemistry, cartography, among many others. As expected, most are teaching collections, research collections, and historical teaching and research collections. There are also collections of institutional memorabilia and art collections acquired for decoration. The majority are from the nineteenth and twentieth century, mirroring the peaks of academic activity in Lisbon as mentioned in the introduction. Size varies from a small group (c. 10–12) to hundreds of thousands of objects, mostly at the museums. Conservation state, housing and storage conditions vary significantly. The majority of collections are not catalogued or inventoried. Some do not have minimal access conditions, and several are stored in attics and basements (fig. 5). The exception is collections of historical books and some archives, which are all accessible, catalogued and in good average conservation state.

As for individual objects identified during the survey, these consist mainly in decorative and integrated art, particularly from the nineteenth and twentieth century (e.g. sculptures, tile and ceramic panels).

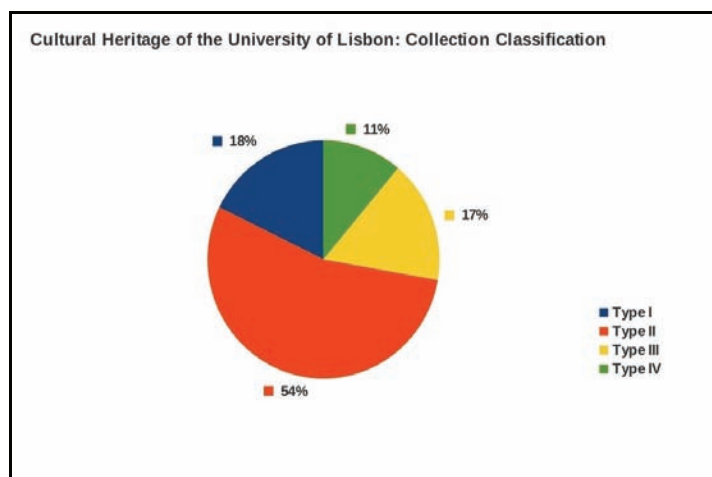


Fig. 5 - Results of the collection classification combining parameters of access, catalogue and conservation, according to the scale provided above (results do not include the collections of the two museums).



Fig. 6 - Painting by Columbano Bordalo Pinheiro, representing medicine professors and doctors, 1907, Faculty of Medicine. Photo: J. N. Lamas, University of Lisbon archives



Fig. 7 - Laboratory from the Câmara Pestana Bacteriological Institute, nineteenth century. Photo: M. Proença, University of Lisbon archives

Finally, as far as architectural heritage, the survey identified 24 buildings and structures of historical, artistic and scientific significance ranging from the thirteenth to the twentieth century. Items from the nineteenth and twentieth century are particularly important, both in the arts and sciences, as they are coherent, well preserved, documented and have not suffer major architectural transformations. In terms of historical buildings of scientific interest, the following should be mentioned: the Laboratório Chimico, Botanical Garden and Astronomical Observatory

of the Lisbon Polytechnic School; the Bacteriological Laboratory at the Câmara Pestana Institute (fig. 7) and the Lisbon Astronomical Observatory at Tapada da Ajuda, all from the nineteenth century. In terms of architectural and artistic significance, the buildings of the Faculty of Fine Arts, Pharmacy School, the Academic Hospital, the rectorate, the Faculties of Law and Humanities, the Faculty of Psychology, a couple of buildings at the Faculty Sciences and the Institute of Social Sciences are also worth mentioning. They are all from the twentieth century except the Faculty of Fine Arts, which is partly medieval, and some have been recently awarded with architectural prizes.

Result dissemination

Although survey data are still under treatment, it was possible to present preliminary results to the university and the general public. A comprehensive directory of collections was included in the publication *Heritage of the University of Lisbon: Science and Art* (LOURENÇO & NETO 2011). This publication also included thirteen in-depth articles about the scientific and artistic heritage of the university. Results were also presented online through the database *Memory of the University*¹⁵ and the national monu-

¹⁵ Cf. memoria.ul.pt/ (accessed November 9, 2011).

ments' database¹⁶. Moreover, a report to the University of Lisbon administration is presently being prepared, with a set of recommendations and guidelines for future preservation, organization, management, and public interpretation of the university's cultural heritage.

Finally, a series of 24 visits to the main collections and buildings of the university aimed at general audiences took place between March and May 2011.¹⁷ This initiative, which enjoyed considerable success among the public, could not have been made without the survey. It contributed to an increasing public visibility of the university's cultural heritage and also to an increasing awareness within the university of the importance of public access.

Discussion

Although a detailed analysis of the survey is still premature, a few reflexions can be put forward. Certainly, as in other similar cases in Europe and elsewhere, the survey of the University of Lisbon's cultural heritage has proven to be a powerful tool to compile valuable information. Without this information it is very difficult, if not impossible, to implement and develop a sustainable plan for the study, management, preservation and public access of university museums, collections and buildings of cultural and historical significance. In particular, this survey has also provided an opportunity to refine methodological tools used in earlier surveys – namely the definition of collection in a university context of the Australian 'Cinderella' surveys – and develop new ones, such as the *Collection Classification System* mentioned earlier.¹⁸ There is, therefore, further research to be made.

In terms of results, these were partly expected and partly unexpected. The heterogeneity and diversity of the heritage of the University of Lisbon is typical of a large European university – in terms of time span, disciplinary coverage, typology and geographical distribution. Also, it was expected that the majority of collections would be teaching collections, research collections and historical teaching and research collections, complemented by decorative art collections and memorabilia. This was consistent with published surveys done elsewhere.

On the other hand, the volume of collections was considerably bigger than initially expected. Although many collections were not catalogued, associated documentation was generally not dispersed or lost, therefore the information is retrievable in the near future. The average conservation state was also considered medium to good. A significant percentage of the collections are still intensely used for teaching and research, including those at the museums. The importance of some historical buildings – namely the two astronomical observatories, the chemistry laboratory and the bacteriological laboratory – transcends the university and the country, given their singularity, in situ conservation state, associated collections and documentation and rarity in the European context. Classification of these buildings as national monuments would signify recognition of scientific heritage as cultural heritage and should be sought. Another interesting aspect, certainly worth further research, is that many collections bear evidence of a broader Portuguese social and political history, probably due to the fact that the university is located in the capital where political elites taught and worked.

Most of the university's heritage is largely unknown from the general public and from the university itself. Access and integrated management are clearly the main challenges for the near future. Contrary to the universities of Coimbra and Porto, the University of Lisbon did not create multiple museums during the twentieth century. It created only two and these only preserve and interpret a limited part of

¹⁶ National Monuments Database, Portuguese Institute for Housing and Urban Rehabilitation (IHURU), cf. www.monumentos.pt/Site/APP_PagesUser/Default.aspx (accessed November 9, 2011).

¹⁷ *100 Locais* (100 University Sites) involved more than 1,000 visitors and c. 130 guest speakers from a wide range of disciplinary backgrounds guiding visits to the different collections, buildings, libraries and archives of the university.

¹⁸ The University of Lisbon collection classification system is presently being used by the Museum of Astronomy of Rio de Janeiro in the national survey of Brazilian scientific heritage.

the university's heritage. Given the geographical distribution and present use for research and teaching of many collections, a possible organizational model could be a network with a centre at the museums, which would have conservation and documentation responsibility over the scattered collections, combined with in situ visits and a programme of rotating temporary exhibitions. This model would enable both public interpretation and use for research and teaching, as well as the combination of access and conservation.¹⁹ The organizational and management model of the university's heritage is currently under debate.

Jubilees and commemorations are important for university museums and collections. They inevitably represent moments when universities look back at their history and ponder their legacy for the future. Many university museums in Europe were created after jubilees. For the University of Lisbon, the challenge is to make the 2011 jubilee more than a mere remembrance moment and, instead, a turning point for the preservation and public access to its heritage.

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¹⁹ This model is already partly suggested in the new museums' statutes, developed in 2011.

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A portal to Dutch academic heritage: www.academischecollecties.nl

HENRIETTE REERINK

Abstract

The UNICUM development project, commissioned by the Dutch Academic Heritage Foundation (SAE), has been carried out by the five classic Dutch universities in 2010-12. UNICUM, short for 'University Collections and University Museums', has received a national government grant to create a digital portal to Dutch academic heritage. The portal, which can be reached via www.academischecollecties.nl, presents both academic archives and museum and library collections. Images, collection metadata and items can be found on one site. The UNICUM idea is inspired by the Online Archive of California.

The project is important because it crosses the traditional sector boundaries between museums, libraries and archives; it creates awareness of the opportunities that this cross-sectoral approach offers; and it retains the context of – and the relation between – objects within collections as a whole. Moreover, the joint effort brings to light the importance of creating metadata according to international standards to stimulate re-use and exchange of content. In addition, UNICUM was intended to be a technical project in which multi-level descriptions are presented and can be browsed in a structured way (collections linked to objects, and archives linked to separate documents). Now that the project is finished, the focus will shift to generating content.

UNICUM aimed to create structured and integrated access to academic heritage by:

- *using international standards (CCO and CDWA Lite) to stimulate exchange of metadata; examining the potential of EAD as an exchange standard for (non-archival) collections and for structuring related items;*
- *determining a common method and creating an online input module for registration at collection level using 'Best Practice Guidelines';*
- *developing an integrated format and online input module for thematic and highlight descriptions;*
- *choosing available and established thesauri which cover all aspects of the future content; focusing on the interrelation between items on one hand and collections as a whole on the other, and - vice versa; an interrelation that tells the story of, and gives meaning to cultural heritage; harvesting of the aggregation's content by Europeana.*

Introduction

Recently the UNICUM portal website www.academischecollecties.nl was launched, a joint effort of the five classic Dutch universities. The portal presents the academic heritage of the Dutch universities. Academic heritage comprises those pre-1850 collections which have grown historically, or actively been collected to meet the educational and research purposes of the universities. Examples are, for instance, historic microscopes, anatomical models and photographs. In addition, faculty archives, and paintings belonging to universities, as well as rare book collections are part of the academic collections. Because of this diversity, the portal presents both academic archives and museum and library collections.

One of the sources of inspiration for the academic heritage portal was the Online Archive of California¹, which was conceived in 2002 and has expanded ever since. In the Online Archive of California more than 200 Californian cultural heritage institutions present their material at both

¹ Online Archive of California www.oac.cdlib.org/ (accessed July 31, 2012).

collection and item level. In the UNICUM project, we started off with five institutions. Our project was commissioned by the SAE, the Dutch Academic Heritage Foundation², which at the start of the project represented the five classic Dutch universities: Utrecht and Groningen being represented by their university museums and Leiden, Delft and Amsterdam by their university libraries³. Last year four more universities joined the SAE – Maastricht, Eindhoven, Wageningen and the Free University of Amsterdam. These four are on the verge of uploading their academic heritage into the recently built portal.



Fig. 1 - www.academischecollecties.nl

The Digital Production Centre (DPC)⁴ of the University Library of Amsterdam built the portal and is responsible for the technical infrastructure, the tools developed in the project and the hosting of the content. DPC uses open, international standards and open source software⁵.

The portal was designed to serve the interested general public, the researcher, and the collection manager himself. During the project we concentrated on developing the project as a whole. Delivering content or creating a website with the newest features were not our main priorities but they are among some of our future challenges.

The project has demonstrated that museums and libraries have different types of expertise to bring to the process: libraries tend to have more hands-on experience with information technology (for instance, applying international standards and using controlled vocabulary) whereas museums are experts in presenting and preserving their material. Both sectors have benefitted from the interaction.

² SAE (Stichting Academisch Erfgoed), Dutch Academic Heritage Foundation www.academischerfgoed.nl/ (accessed July 31, 2012).

³ Leiden University Library www.library.leiden.edu/ (accessed July 31, 2012).

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Delft Library www.library.tudelft.nl/ (accessed July 31, 2012).

⁴ Digital Production Centre (DPC) www.uba.uva.nl/digital_production_centre/home.cfm (accessed July 31, 2012).

⁵ Open source software used by DPC (XTF) xtf.cdlib.org/ (accessed July 31, 2012).

Object metadata

UNICUM can be considered a metadata project, and the object metadata of all the partner institutions was especially challenging. During the project, their metadata was converted to CDWA Lite⁶, the data structure standard⁷ of the Getty Museum, which DPC chose as the portal's format. Now that the project has been completed the partners are expected to work according to standard mappings⁸ which were created for this purpose. They will offer their metadata to the UNICUM portal in such a way that these mappings can be used. The partner institution is responsible for its own metadata within the portal, not the DPC.

Standardization facilitates mapping to the aggregation but it was clear that many partners did not describe their objects according to international standards. This hampers the (international) exchange of data. There were cases where a single institution did not use one particular method for describing their various collections, but where different collections were described in markedly different ways. The pitfalls of describing diverse materials are well-known, and academic collections are usually varied. It must be emphasized that consistency is a key factor here. Even when items have been catalogued incorrectly, as long as this has been done consistently, the errors can sometimes easily be corrected.

Two examples of mistakes we came across that resulted in data loss:

- At some point in time, an institution transferred its metadata to another database system. This was not done as carefully as necessary and all distinguished elements were placed in one or two fields in the new database. At the time, no-one was aware of the consequences, and no back-up copies were kept. As a result, years of work were lost.
- When trying to obtain a dump of metadata from a university museum collection, we came across a file published on the Internet that contained the required metadata. The html file differed considerably from the file of metadata extracted from the database; it was much richer in data. It turned out that records were updated in the static html file, instead of in the source database.

To prevent such mistakes in the future, as well as to guide institutions through the tricky field of cataloguing, the UNICUM partners were advised to use a metadata content standard⁹. The project did not impose standards, but tried to convince the partners by illustrating its benefits. We recommended CCO (Cataloguing Cultural Objects)¹⁰, the content standard for the cultural heritage community. The CCO guide to describing cultural works and their images is available online¹¹. These guidelines are illustrated by examples and answer many questions about how to fill in the defined fields in database records of cultural heritage institutions. The CCO content standard is based on a subset of categories of the CDWA data structure standard, the native DPC format for the UNICUM portal. We added a

⁶ CDWA Lite www.getty.edu/research/publications/electronic_publications/cdwa/cdwalite.html (accessed July 31, 2012).

⁷ A data structure standard is a formal guideline specifying the elements into which information is to be organized. By establishing a set of elements to be included, a data structure standard also excludes other types of information. EAD, CDWA and MARC formats are examples of data structure standards.

⁸ In the project standard mappings have been created from the data structures used at the partner institutions (MARC, AdLib) to the CDWA Lite data structure of the portal.

⁹ A data content standard is a set of formal rules that specify the content, order, and syntax of information to promote consistency. A content standard goes beyond identifying the general type of information and indicates how to select between different, equivalent representations of the information and the manner the information is to be structured. For example, a content standard for a field called 'creator' might indicate whether an individual's common or full name should be used and whether the name should be inverted. For example, Lewis Carroll might be entered as 'Dodgson, Charles Lutwidge'. *Anglo-American Cataloguing Rules* (AACR), *Cataloguing Cultural Objects* (CCO) and *Archives, Personal Papers, and Manuscripts* (APPM) are examples of content standards.

¹⁰ CCO cco.vrafoundation.org/ (accessed July 31, 2012).

¹¹ cco.vrafoundation.org/index.php/about/news_events_entry/258 (accessed July 31, 2012).

language field to this format, since language is not used as a distinguishing criterion in the museum world, whereas it is an essential prerequisite in the library and archive domains.

Thesauri

The project illustrated the advantage of consistent metadata described according to a content standard. The use of controlled vocabulary also proved beneficial when it was time to publish the metadata in the portal website, as the site can be searched by both word and attributed keywords. Whereas the two partner university libraries (Leiden and Amsterdam) use controlled vocabularies and (inter)national thesauri, most partner museums work with lists of keywords of their own design. Obviously, such lists are not conducive to international data exchange in these days of globalization.

objectWorkType

- tekening: portret (19)
- tekening: plattegrond (3)
- tekening: architectuur (22)
- tekening en aquarel: architectuur (1)
- sculptuur: portret (2)
- schilderij: portret (18)
- prent: topografie (1)
- prent: tekening en architectuur (1)
- prent: tekening (1)
- prent: portret 4)
- prent: plattegrond (8)
- prent: interieur (2)
- prent: groepsportret en architectuur (2)
- prent: groepsportret (2)
- prent: bouwtekening (3)
- prent: architectuur, plattegrond (2)
- prent: architectuur en spotprent (1)
- prent: architectuur en naamlijst (1)
- prent: architectuur en groepsportret (6)
- prent: architectuur en genrestuk (1)
- prent: architectuur (335)
- prent: allegorie (3)
- prent (3382)
- portret: tekening (1)
- portret (632)
- pentekening en architectuur (1)
- penning met judicium (1)
- penning met bijbeh. cassette (1)
- penning (8)
- groepsportret (2)
- gebeurtenis (38)
- fotomateriaal: fotoafdruk papier zwart wit (662)
- fotomateriaal: fotoafdruk papier kleur (1)
- fotomateriaal (439)
- fotoafdruk (439)
- dubbelportret (Ravetz. Prof. dr. J. R. (1965) (1)
- dubbelportret (4)

For example, at the moment 'portrait' (2507 hits) is a keyword in the portal, as well as 'portraits' (1146 hits). If all partner institutions had made use of controlled vocabulary, these two keywords would have been combined. This example is not directly fundamental while searching the portal. But it does mean that the facet searching option within the portal loses its function, as fig. 2 illustrates.

In UNICUM we recommend using controlled vocabulary to fix this problem. We advised the partner institutions to use at least the AAT (Art and Architecture Thesaurus)¹² and the NBC (Dutch Basic Classification)¹³ which classifies according to academic discipline. Both thesauri contain Dutch keywords that are related to their English equivalents.

One of the conclusions of the project was that a common data cleaning and enrichment project for the metadata would be of interest to all partner institutions. The Dutch Academic Heritage Foundation (SAE) was advised to take the initiative and find money for such a project. Before such a project is launched, the legacy records at the involved heritage institutions should be carefully screened in order to draw up the specifications for the data cleaning and enrichment. Various open source software is available on the Internet to handle the process of metadata cleaning and enrichment.

Collections, items and stories

The portal was built around different related components: collection descriptions (museum and library collections) with inventories (archives), item descriptions (museum, library and archival objects), stories and images.

Fig. 2 - Self-designed keywords, instead of controlled vocabulary, as delivered to the portal's repository

¹² AAT www.aat-ned.nl/ (accessed July 31, 2012).

¹³ NBC www.kb.nl/vak/basis/bc04.pdf (accessed July 31, 2012).

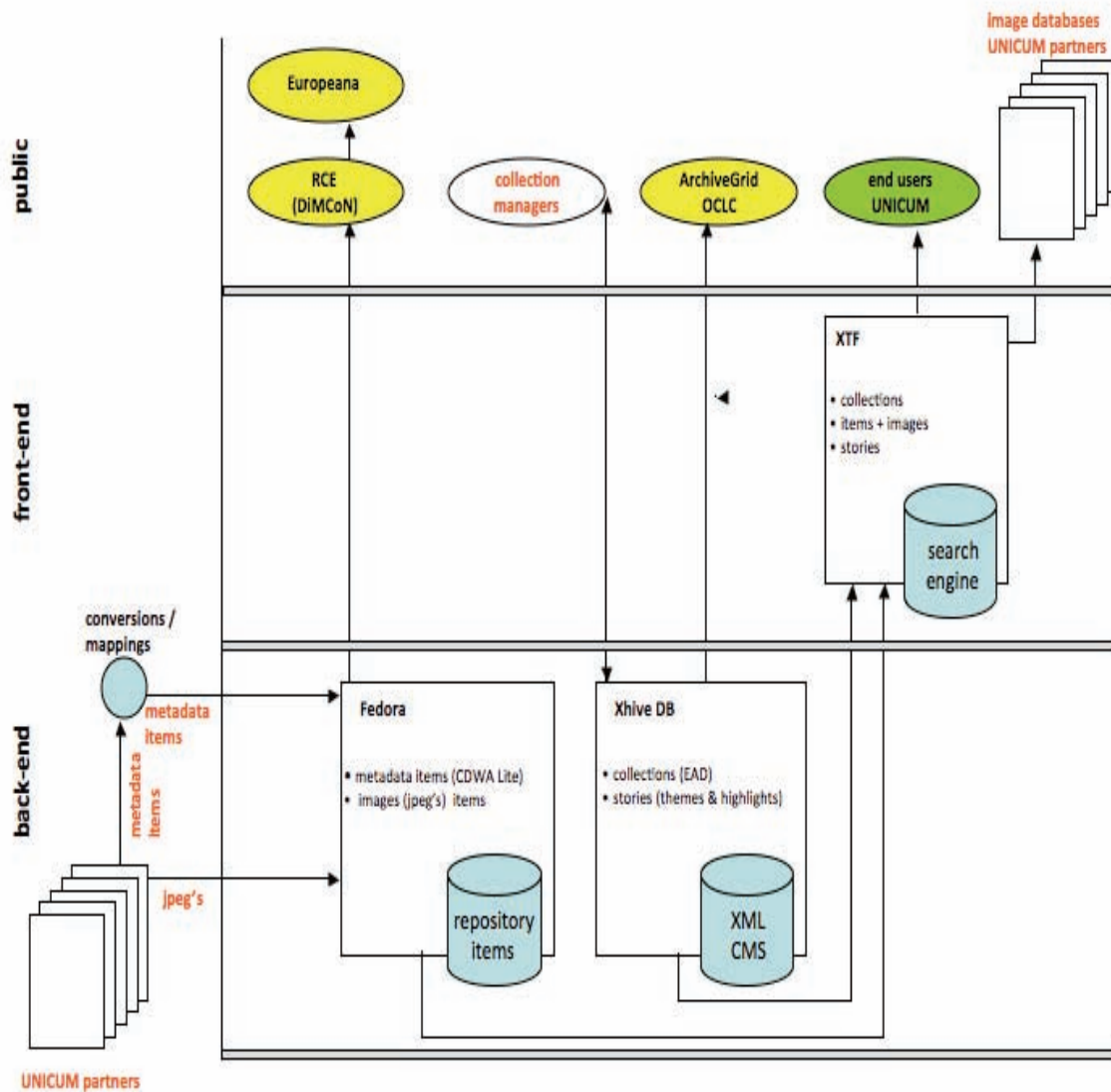


Fig. 3 - UNICUM flow chart

Collections

Like the Online Archive of California, we chose to use the archival EAD¹⁴ format to describe both museum and library collections. Best Practice Guidelines for collection registration were formulated and all partners now describe their collections accordingly.

The archival EAD standard is known for its multi-leveled complexity and xml encoding. DPC has made a specially designed input module¹⁵ which simplifies the process and which can transform the delivered content into EAD xml right away. Institutions are supplied with a login to use the input form through the Internet. University libraries already working with EAD can supply the DPC with their own generated xml and do not have to use the input module.

The museums in the project are content with the EAD format. They have already described some of their collections in the EAD input module following the guidelines. They have actually requested a similar format and Best Practice Guidelines for describing their items. That was beyond the scope of

¹⁴ EAD www.loc.gov/ead/ (accessed July 31, 2012).

¹⁵ with Windows X-Forms.

the project, but the content standard CCO, which we chose during the project, has met their needs in many ways already.

Inventories

Multi-layered archives can be described very well by means of the inventory levels offered by EAD. It is possible to link various archival series to a basic, upper-level description. An online input module for inventories has not yet been realized, and this will remain a challenge to be tackled in the near future. EAD xml for inventories can be delivered directly to DPC, which implies that libraries with EAD experience will be able to upload their inventories to the portal. The design of the inventory part in the web portal and the routing from the DPC infrastructure should be adapted in a later stage, when the remaining issues around inventories have been resolved.

Items

As shown in Fig. 3, the partner institutions will recurrently supply DPC with metadata exports of their items to be uploaded into the UNICUM aggregation. The accompanying conversion and mapping procedure have been discussed in the previous section on object metadata. The idea of harvesting¹⁶ the partner's metadata by DPC still remains wishful thinking. At the moment, it is not yet possible for either the museums to be harvested, or for DPC to harvest data from the partner institutions. We hope to tackle this issue in a future project.

Stories

To enliven the portal's website, the partners may publish stories about special themes or objects. These stories can be uploaded by means of an online input form designed by DPC, analogous to the EAD input module for collection descriptions. In this way universities can work together to create thematic profiles of their academic heritage.

Images

Previews of the items are presented to the user in the portal¹⁷. The heritage institution which possesses the material is responsible for the copyrights, not DPC. The thumbnails are linked to the image databases of the universities which own the items. To see the complete picture instead of the thumbnail, the user is directed to the particular website of the owning institution. This also applies to composite objects, such as books, which will be presented only as a single thumbnail within the portal. Smaller museums often do not use web-based image databases and the portal www.academischecollecties.nl offers them the possibility to increase the visibility of their holdings in a relatively easy and instant way.

International exchange: ArchiveGrid and Europeana

The collection descriptions in the EAD format will be sent periodically to ArchiveGrid¹⁸, the OCLC database of archival / collection descriptions. For this purpose the abstracts of these descriptions have been translated into English, and the keywords are also submitted in English.

The object metadata and thumbnails of the aggregated items in the portal will be harvested by Europeana¹⁹. Europeana is an initiative by the European Commission to provide a single point of access to the digital content of Europe's cultural heritage institutions such as (audio visual) archives, museums and libraries. Presently, Europeana is not yet able to process metadata at the collection

¹⁶ Harvesting is an automated, regular process of collecting metadata descriptions from different sources to create useful aggregations of metadata and related services.

¹⁷ Partners have to supply their images to DPC in a 750 pixel wide jpg format.

¹⁸ ArchiveGrid archivegrid.org/web/index.jsp (accessed July 31, 2012).

¹⁹ Europeana www.europeana.eu/portal/ (accessed July 31, 2012).

level. The European ApeNet²⁰ project aims to contribute multi-level archival descriptions to Europeana.

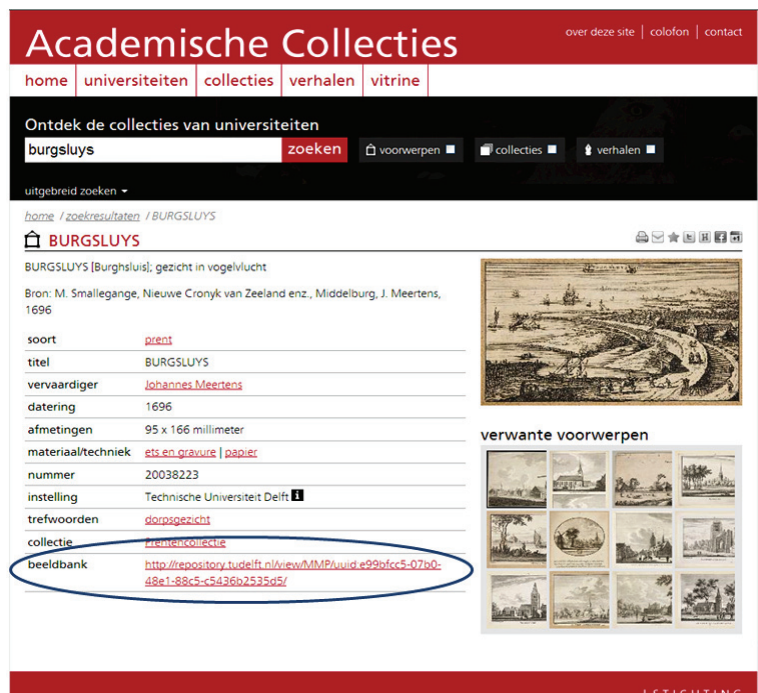


Fig. 4 - www.academischecollecties.nl

Europeana does not do business with individual institutions or new portals, and only works with national aggregators. In the Netherlands, the Ministry of Education, Culture and Science distributed the cultural heritage sector roughly into four Europeana aggregators according to material types²¹:

1. RCE²², the Dutch National Cultural Heritage Service for museum material
2. The National Library of the Netherlands²³ for text material
3. The Netherlands Institute for Sound and Vision²⁴ for audio visual material
4. The National Archives of the Netherlands²⁵ for archives

The newly created portal www.academischecollecties.nl will deal with the RCE, since the majority of the content can be marked as museum material and, more importantly, because the RCE is already applying a well-functioning tool to convert the UNICUM metadata to the Europeana format. This tool was developed by Delving²⁶, the software company which wrote the Europeana software. This, of course, is a major advantage, since Delving knows all the technical ins and outs of Europeana.

The Delving SIP-Creator²⁷, as the tool is called, is an open source conversion tool which can be used and adjusted by anyone according to his or her needs. If the input follows international standards, as it is in our case (the data structure of the portal being CDWA Lite), a sustainable mapping to the

²⁰ ApeNet www.apenet.eu/ (accessed July 31, 2012).

²¹ Dutch Europeana aggregators digitalecollectie.nl/ (accessed July 31, 2012).

²² RCE www.cultureelerfgoed.nl/ (accessed July 31, 2012).

²³ The National Library of the Netherlands www.kb.nl/index-en.html (accessed July 31, 2012).

²⁴ The Netherlands Institute for Sound and Vision instituut.beeldengeluid.nl/index.aspx?ChapterID=8532 (accessed July 31, 2012).

²⁵ National Archives of the Netherlands en.nationaalarchief.nl/ (accessed July 31, 2012).

²⁶ Delving www.delving.eu/ (accessed July 31, 2012).

²⁷ SIP-Creator vimeo.com/19291418 (accessed July 31, 2012).

Europeana format can easily be created. And if it is not, the tool creates practical out-of-the-box conversions to Europeana.

The portal's content is harvested by the RCE and has been technically incorporated into DiMCoN – Digital Museum Collection Netherlands²⁸. The Dutch Academic Heritage Foundation (SAE) is on the verge of signing the contract with the RCE and therefore with Europeana. Last year Europeana adopted a new contractual agreement in which the Creative Commons Zero (CC0) license was accepted for the metadata in Europeana (the images still fall under the CCby license). The UNICUM project partners discussed the conditions of the contract before they consented to the harvesting of their content from the UNICUM portal by the RCE (Europeana).

A few issues still remain unsolved. For instance, there is a risk that the same content of the same institution will be uploaded to Europeana more than once. Europeana has established a working group to deal with this issue. Each individual institution also has to decide by which aggregator it wants to be harvested in the end, because, obviously, institutions will only want to invest for this one time.

Added value

What is the added value of the portal? One may wonder whether it would not have been more practical for the five original UNICUM partners to deal directly with the RCE or the National Library to exchange their data. That might have been the case if the only goal of the portal's partners was to become part of Europeana. However, the merits of using standards with regards to metadata were immediately clear within the UNICUM project. Every single project partner has profited in its own way from the knowledge gained in the project of building a portal.

By commissioning this portal, the Dutch Academic Heritage Foundation (SAE) can stimulate the presentation of academic heritage and use UNICUM to create a distinct profile for itself. Last year four more Dutch universities joined the Academic Heritage Foundation, so that the SAE now houses almost all Dutch universities. The SAE has become a stronghold, also in applying for grants or other subsidies.

The portal may also help for Dutch collection managers to fine-tune their collections. More importantly, the university museums that have joined UNICUM will not have to initiate the project by themselves, as we can do it collectively. And that is what we wanted from the start: co-operation to meet the challenges and opportunities of globalization.

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²⁸ DiMCoN www.digitalecollectienederland.nl/ (accessed July 31, 2012).

Proposed European anatomical collections network

ELENA CORRADINI & MAREK BUKOWSKI¹

Abstract

Universities, colleges, medical institutions and professional societies in the past used their museums as tools to establish themselves as the rightful producers of anatomical knowledge. Anatomical and medical museums, nearly ubiquitous in the cities of Europe and the United States, exhibited and preserved anatomical specimens as well as models and sculptures – some displaying great artistic and technical finesse – which depicted human anatomy in graphic detail.

A European anatomical collection network proposes to obtain, collect, and analyze a wide range of information about anatomical collections in Europe.

For our proposal it is important to focus the attention on ‘how’ as well as ‘what’ has been collected, to the strategies adopted for showing the collections, to the people who had access to the collections and the degree to which their prior experiences and expectations may have shaped their responses to it. It is also important to consider the geographical location and origins of anatomical collections, their anatomical models and specimens, the contents of lectures, the audiences targeted and also the questions raised in historical, sociological and anthropological literature about anatomy.

Introduction

Universities, colleges, medical institutions and professional societies in the past used their museums as tools to establish themselves as the rightful producers of anatomical knowledge. Anatomical and medical museums, nearly ubiquitous in the cities of Europe and the United States, exhibited and preserved anatomical specimens as well as models and sculptures – some displaying great artistic and technical finesse – which depicted human anatomy in graphic detail (KEMP & WALLACE 2000).

A good collection was a mark of status which would not only distinguish a university, a college or an institution from the others, but also serve as an assertion of legitimacy which grounded itself within the larger context of the natural sciences.

Museums are dynamic, vibrant entities that grow, shrink and adapt to shifting circumstances: It was common for anatomical and medical museums to retain scientific equipment in order to allow laboratory work to be done on site, and a museum’s ability to house a large collection of specimens and to possess space available to scientists and scholars was considered a primary role of the institution.

Renaissance ‘cabinets of curiosity’ boasted elaborate skeletal displays and in the 17th century, new preservation techniques allowed the long-term storage of soft tissues in spirits. But only in the mid-18th century did anatomical collections in their modern form begin to emerge (ALBERTI 2011a).

For a project about anatomical collections, it is important to focus the attention on ‘how’ as well as ‘what’ has been collected, to the strategies adopted for showing the collections, to the people who had access to the collections and the degree to which their prior experiences and expectations may have shaped their responses to it (BONNER 1995; CHAPLIN 2008, 138). It is also important to consider the geographical location and origins of anatomical collections, their anatomical models and specimens, the contents of lectures, the audiences targeted and also the questions raised in historical, sociological and anthropological literature about anatomy (SCHNALKE 2004; SECORD 2004).

¹ *Anatomical collections for teaching and explaining anatomy* is primarily Bukowski’s work; *Anatomical and medical museums* is primarily Corradini’s work and the introduction and the third part is common work.

Anatomical collections for teaching and explaining anatomy

The human body with its functions is an object of research and an instrument of experience: in the late medieval period anatomical knowledge in Britain and Europe was largely based on manuscripts from classical Greece and medieval Italy, the dissection of animals such as pigs, and the intermittent dissection of condemned criminals (VESALIUS 1543; PARK 1994; PARK 1995; OLRÝ 1997; FRENCH 1999). However, by the 17th century, the situation changed as printed books of anatomical texts from Italy and France became more widely available (CUNNINGHAM 1997; CREGAN 2010; MITCHELL ET AL. 2011, 91).

Anatomical dissections took place in universities or schools of medicine or in others government supported institutions and were often commemorated in paintings or in printings: both the body and the audience were subject to the abstracting power of the anatomy text (GUERRINI 2004, 222; RUGGERI & PONTONI 2005; NESI ET AL. 2009).

The dissections were public in a limited sense: they were used as pedagogical displays intended for the edification of persons who were interested in the practical arts of setting bones, letting blood, kidney stone and kindred operations (lithotomy) and assisting in difficult childbirths. They were educational displays to learn the structure and functions of human body for the professional training: the recasting of dissections can be considered both as a form of personal improvement (PAYNE 2007) and a means for the development of the important professional competences of clinical detachment and empathy (HILDEBRANDT 2010).

Learning human body structure by performing hands-on dissections in the anatomical theatre had become a fundamental element of contemporary medical education to know as much as possible about the parts of the body and their functions, the body's physiology and, when faced with illness, its pathology, being in professional competition with physicians: the human body was studied as a book to be read to learn what it was and what it meant to be alive with respect to anatomical, physiological, pathological and therapeutic knowledge (PÉREZ-PÉREZ 2010, 38; 46).

Starting from the seventeenth century and during the eighteenth century, auditoriums across Europe were filled with audiences attending lectures that included anatomical demonstrations of dissection upon human cadavers (FERRARI 1987).

In the following century forthcoming dissections were also advertised in newspapers and public anatomies were arranged for permanent exhibitions; for example, at the Präuscher's Panoptikon und Anatomisches Museum, established in the Prater amusement park from 1871 until its 1945 destruction (BUKLIJAS 2010).

According to traditional strategic and disciplinary methods, through the practice of anatomical dissections the body was handled – literally and figuratively – framed, presented and represented, abstracted in texts and illustrations (CHOULANT 1852; KEMP 2004; RIVA ET AL. 2009): Anatomical treatises were designed to be used in front of a dissected cadaver, but the drawings could not portray the experience of the sight and smell of a dismembered body (FRANCIS ET AL. 2001; MANDRESSI 2003; HORSLEY 2010, 17).

The space in which these anatomies were performed and the practices by which that knowledge was imparted, shaped the ways in which the human body was understood – a slow and uneven process – by which the body was subjected to a process of abstraction (KEMP & WALLACE 2000): with anxiety and wonder concerning knowledge of the body (HAYES 2008; WOLFE & GAL 2010).

It is interesting to study the processes and ceremonies involved in learning anatomy in the rooms where corpses were dissected and how the dissected bodies were treated, perceived and reshaped by the practice of anatomical pedagogy. According to Kate Cregan (2009), there are two key factors: the structure of the space in which the anatomical dissections took place, and the embodied actions performed within that space associated with the dissections conducted there.

The public autopsies at the hall were ceremonial occasions: As the construction of the anatomical theatre ensured the regulation of the people that entered it, so too did the carefully regulated anatomical performances which took place in it, following an old tradition explained in Alexander Read's (1638) *The manual of the anatomy or dissection of the body of man: containing the enumeration and description of the parts of the same which usually are shewn in the publick anatomical exercises*. The dissection would also lead inevitably to contemplation of the meaning of death itself. The excessive emotion provoked by witnessing anatomy and particularly vivisection could turn against the moral purpose of the demonstration. In theory, dissection appealed first to the intellect and then to the emotions, but – as the proponents of the ancients contended in their ongoing debate with the moderns – witnessing anatomy could engage the emotions of the audience far more than it engaged their intellectual faculties. But as with public executions, the close presence of a dead human body could be emotionally disturbing: Dissection and vivisection could be intended as violent and transgressive acts (GUERRINI 2009, 10).

Moreover, sometimes these public dissections could have a limited role in education and research, because the performance was frequently geared towards the entertainment of authorities and paying visitors, and students could not discuss controversial issues at length. In addition, they were seated at a considerable distance from the dissecting table, behind the rows of professors and municipal officials (MARGÓCSY 2011, 3).

Anatomical and medical museums

Medical institutions and professional societies used their museums as tools to establish themselves as the rightful producers of anatomical knowledge: Very significant was the role of museums as formal spaces for the display of the products of anatomical investigations, not only preparations, pieces of human preserved in spirit or later in formalin (wet preparations) or in the exsiccated form (dry preparations) or obtained with a variety of processes used in their manufacture – like dissections, injections, fixation, maceration, and mounting (POLE 1790) –, but also of objects classed as either 'humane rarities' or 'anatomical curiosities' (APPLEBY 1996).

Anatomical and medical museums were aimed at professional societies or institutions where men learned to become doctors: on the one hand the discipline of anatomy afforded obvious contributions specific to the creation of the medical professional's identity (WOLFE & GAL 2010); on the other hand, the medical profession was responsible for disseminating information about anatomy to a larger audience (KNOX 1836).

Historical anatomical and medical museums were founded as the result of the collections made by medical teachers and practitioners who would then bequeath them to an institution or professional society. These collections would then be added to over time, enhancing the eminence of the institution. Interest in these collections was by no means limited to would-be medical professionals, but was shared by what might be understood as an 'anatomically-curious' public audience (FERRARI 1987).

Until the late eighteenth century, natural science collections, like artistic and archaeological collections, were accessible to an audience limited to elites who, most frequently by dint of birth or

occasionally by educational attainment, possessed the status necessary to view them (PORTER 1995). Only at the end of that century in Italy the anatomical collection created by the Grand Duke of Tuscany Peter Leopold (1765-1790) in Florence in the Imperial-Royal Museum for Physics and Natural History at La Specola was accessible to a general public including, specifically, the 'lower classes': It also provided an institutional model for displaying anatomy which was subsequently copied in Europe and America (POGGESI 2001, 6).

With a sort of an aesthetic strategy, the dissector and the preparer transformed messy and complicated bodies into abstracted and neatly presented objects, which mirrored naturalistic representational practice in medical or scientific illustration in which objects were generally presented

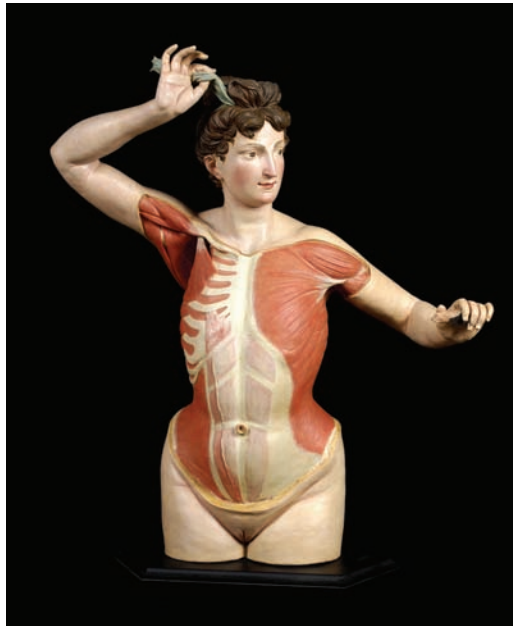


Fig. 1 - Giovan Battista Manfredini, Anatomical clay representing a feminine bust, 2nd half of 18th century. Photo: Giorgio Merighi © Anatomical Museum Archive



Fig. 2 - Anatomical wax representing a feminine pelvis with urogenital system and stretch of abdominal aorta, 2nd half of 18th century. Photo: Giorgio Merighi © Anatomical Museum Archive

without contextual imagery or symbolic adornment (LATOURE 1990, DASTON & GALISON 1992; ROBERTS & TOMLINSON 1992; BENSUADE-VINCENT & BLONDEL 2008; CHAPLIN 2008, 144; RIVA ET AL. 2009).

Preparations of dehydrated organs were placed on plaques in rows; specimen jars filled with wet preparations were available for spectators to examine on shelves; moulages in wax demonstrated pathologies of various kinds, partial and whole skeletons lined the walls, and every organ known to the discipline of anatomy could be on view.

Specimens and preparations were particularly useful for recording morbid features and abnormalities: They were used to register the results of specific observations or experiments, and were often cited by authors as evidence of priority in anatomical discovery (EALLES 1974), and they played a crucial role for teaching in anatomy, surgery and midwifery, where they were used alongside, rather than instead of, cadavers as a means of demonstrating normal or morbid anatomical structures (ALBERTI 2011b). Their utility was partly a function of their physical properties. While not impervious to decay, preparations were more stable than fresh tissue and lacked the noisome qualities of freshly dissected cadavers. Moreover they could be handled and transported in ways that cadavers or unfixed tissues could not.

Learning to 'read' specimens and preparations was one of the specific practical skills which anatomy teachers sought to inculcate in their students, by encouraging their use as one element of a tripartite autopsy system that also involved observation of the dead cadaver and the live patient (HUNTER 1784, 89–92; LAWRENCE 1993, 165–170). Students were encouraged to make their own preparations as a way of becoming familiar with their properties as material objects, and also, for private study, to amass their own collections of specimens and

preparations. Thus were collected in private museums (HUNTER 1784, 110; COOK 2002) images in print, oil, and watercolors (CHAPLIN 2008, 140) but wet preparations preserved in liquid and stored in sealed glass (towards the late nineteenth century, formaldehyde, a compound synthesized in the mid-19th century and used in organic chemistry, came to dominate bodily preservation); dry preparations obtained by extracting all liquid from the specimen and then injecting the object with wax – as wax replaced blood in the circulatory system, the cadaver's collapsed organs were restored to their natural state of life (DEGUEURCE & ADDS 2010); anatomical casts prepared in plaster from molds created from actual anatomical subjects; anatomical models in papier-mâché, clay (fig. 1–2), ivory or bronze (OLRY 2000); petrified preparations, organs and body parts hardened by chemicals, combined together and then cut into decorative tableaux.



Fig. 3 - Giovan Battista Manfredini, Anatomical clay representing a womb of a twin birth, 2nd half of 18th century. Photo: Giorgio Merighi © Anatomical Museum Archive



Fig. 4 - Remigio Lei, Table with several enlargements representing the sensory corpuscle of Pacini, 19th century. Photo: Giorgio Merighi © Anatomical Museum Archive

Anatomical models in wax (BALLESTRIERO 2010; COOKE 2010) started to appear from the 17th–18th century (fig. 3) and continued in the following century (fig. 4) in order to provide more visual information than was possible in the two-dimensional illustrations. These wax models compensated for the lack of effective preservation techniques for cadavers, which made dissection of deteriorating bodies highly unpleasant (MUSAJO SOMMA 2007; PATTISON 2007; RIVA ET AL. 2009, 220).

The aim of displaying certain groups of specimens and preparations was not only to demonstrate physical difference, but to explain the larger implications of what these physical differences might mean. However even if the models on display had been subject to a neat categorization, they would still escape full mastery, for death refuses to be mastered by the living (JORDANOVA 1999, 14; CASSELL 2005).

Starting from the middle of the nineteenth century, the developing fields of ethnography and anthropology moved into the anatomical museums, sometimes to the

point of incorporating these disciplines' names into the appellations of museums themselves or the collections of specimens or into the exhibition of the anatomical museums. The anatomical museum created a revelatory space in which self-evident principles could be more broadly applied to racial or ethnic populations, where the bodies were, in essence, documentation of the types of persons on display. The nineteenth century is rife with examples of anthropologically-based racial constructions that arose in scientific institutions; it should hardly be surprising that central to these constructions was the body itself (WOLF 2010, 49). The anatomical museums became a sort of forum for proposing social constructs of race, reinforced by the purported objectivity of science.

In the medical museum of nineteenth century, doctors were eager to distance their profession with the scientific triumph of logic over the superstitions of 'monstrosities' that characterized medical texts of

the previous century. The specialized knowledge that medical authorities trained so arduously to comprehend were rendered visible to anyone (RUGGERI & PONTONI 2005).

By century's end, medical institutions had insisted on the right to display the human body in the medical museum, though the museum itself had lost much of the pedagogical value for the discipline which it had been founded to serve (WOLF 2010, 66).

Medical museums remained large and well used into the twentieth century as the popularity of health exhibits in vast international expositions demonstrated. Changes in medical education and the academic status of material culture generally took their toll in the later twentieth century, however, especially the reduction in the number of post mortem examinations (Cooke 2006; BUKLIJAS 2010).

Dissection remained a keystone in the training of the would-be medical doctor, but was attended by difficulties quite similar to those found in the anatomical theatres dating from earlier times. As with anatomical theaters of the eighteenth century, bodies as 'source material' were not easy to acquire, and controversies over how medical colleges obtained these bodies was a matter of public debate (SAPPOL 2002). For this reason, medical and anatomy museums were a teaching tool where the medical trainee could approach anatomy without taking an active role in acquiring the bodies of the dead (RICHARDSON 2001; CRIGNON-DE OLIVEIRA & GAILLE-NIKODIMOV 2004).

In recent years anatomy and pathology collections have diminished their leading roles in medical education for many reasons: a lot of specimens in anatomical and medical museums have become artifacts of a past which had once favored gross anatomy, bypassed by professionals in the field who were busily pursuing increasingly complex biological theories and their interests in biological and biomedical research activities, even if recently new anatomical specimens have been created like plastinated specimens, obtained by a tissue preservation technique that uses durable polymers to replace water and lipids, resulting in durable, dry and odorless specimens (WALTER 2004; MARKOVIĆ & MARKOVIĆ-ŽIVKOVIĆ 2010).

Dissections and preparations by anatomists or medical students and the disposal and burial of the remains or the preservation of teaching specimens that survive today in medical museums are complex and fascinating (HACKETT 1951; MITCHELL ET AL. 2011, 91).

To avoid collections being seen as ghoulish repositories of disembodied remains, it is important to find in labels, documents or books their stories with their own narratives and variable meanings (BLACKWELL 2007; WOLF 2010).

Even though medical museums failed to erase the need for dissection and other types of medical training, they met professionalizing needs similar to those of natural science museums in the nineteenth century, where the collections were exhibited for pedagogical purposes and where knowledge production and experimentation could flourish (MARREEZ ET AL. 2010).

There are some controversies which are just as relevant today as they were when they were discussed in past centuries: Who was authorized to exhibit anatomy? What sorts of bodies were appropriate for display? Who ought to be permitted to view anatomy?

Through a careful planning of an interdisciplinary collaboration, anatomical and medical museums can generate and facilitate a range of activities pertaining to an education and research functions: by seeking out such opportunities they will remain relevant and innovative (e.g. the Wellcome Collection recently opened in London which revealed considerable public appetite for medical heritage²).

² www.wellcomecollection.org/Default.aspx (accessed January 31, 2012).

European Anatomical Collections Project

Among many possible systematic approaches for a project concerning the anatomical collections, we have decided first of all to design a prototype for an online survey. This survey aims at collecting a first set of data about anatomical and medical collections and it will be submitted to the museums that are recorded in two significant databases about University Museums: the Italian POMUI – the Portal of Italian University Museums³ (CORRADINI 2012) – and the international UMAC Worldwide Database of University Museums & Collections⁴ (fig. 5–6). Working in a network is a basic cultural choice, a commitment to grow and to improve as production centers of knowledge, activities and services.

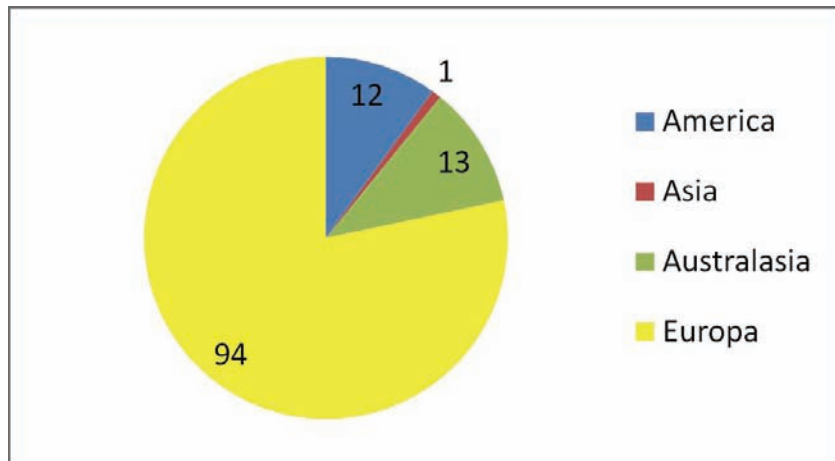


Fig. 5 - Anatomical and medical museums and collections recorded in the UMAC Worldwide Database of University Museums & Collections (as at September 2011).

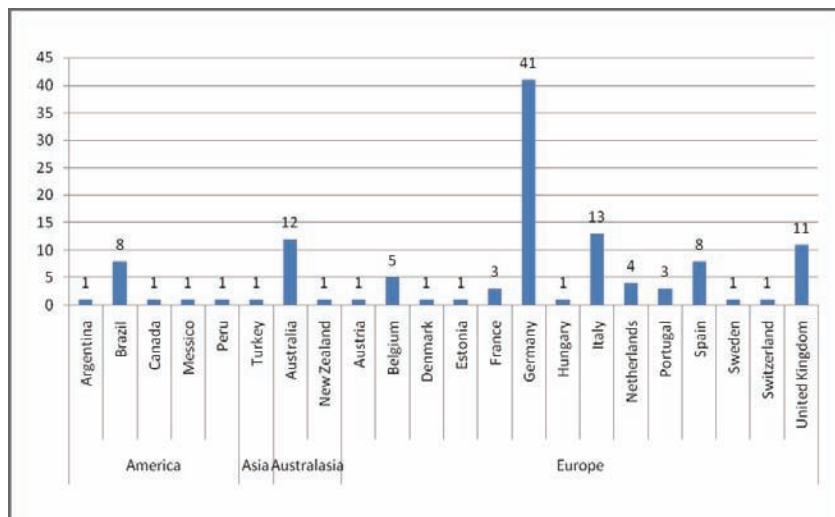


Fig. 6 - Anatomical and medical museums and collections recorded in the UMAC Worldwide Database of University Museums & Collections: detail for each country (as at September 2011).

The prototype for the online survey to collect a first set of data about anatomical collections is structured in nine sections. The basic areas of interest for the project are:

³ www.pomui.unimore.it (accessed January 31, 2012).

⁴ publicus.culture.hu-berlin.de/collections (accessed September 28, 2011).

- A. General information
- B. History and type of collection
- C. Status of research connected with the collections
- D. Objects of the collections
- E. Conservation
- F. Documentation
- G. Exhibition
- H. Accessibility
- I. Contemporary anatomists and fields of interest

The survey has altogether twenty questions; each section is composed of several specific questions as follows:

- A. General information: questions 1–2.
- B. History and type of collections : questions 3–7.
For the historical survey, it is important not only to complete the historical overview, but also to clarify the invisible mechanisms behind the making of anatomical and medical museums and their relations with public audiences and medical professionals.
- C. Status of research connected with the collections: question 8.
The aim is to illustrate the influence of changes in anatomy on development of medicine and the changes in anatomy 'per se': more sophisticated methods of research, analyzing and synthesizing of results, to better understand the structure and the functions of the human body.
- D. Objects of the collections: questions 9–10.
- E. Conservation: questions 11–14.
- F. Documentation: question 15.
- G. Exhibition of historical specimens: questions 16–17.
The main questions are: how are historical specimens presented in today's museum and how are their meanings transformed so as to fit today's interests? How do those who manage the collections regulate public curiosity? This will lead to a better understanding of the reciprocal relation between those looking at the collections and specific ways of exhibiting the anatomical body; for what purposes (teaching or general interest?) and how they should be exhibited?
The display of human remains in any museum is a complex issue that demands a complex answer. Allowances need to be made for the missions within museums that display human remains, as medical and science museums present exhibitions in a different context than natural history and historical museums. In anatomical and medical museums, it is necessary to define curatorial practices regarding human remains through legal guidelines and museum policies – in particular according to ICOM (International Council of Museums)⁵ and Department of Culture, Media, and Sport,⁶ and to the American Association of Museums (American Association of Museums)⁷ and other recent documents –, clarifying the need for thorough interpretation, ethical context and provenance, and for sensitive displays of human remains appropriate to the mission of the museum. (ANDERSEN 2010).
- H. Accessibility: question 18.
- I. Contemporary anatomists and fields of interest: questions 19–20.

⁵ *ICOM Code of Ethics for Museums*, 2006, 2006, 9, icom.museum/fileadmin/user_upload/pdf/Codes/code2006_eng.pdf (accessed January 31, 2012).

⁶ *Guidance for the care of human remains in museums*, 2005, 12, icom.museum/who-we-are/the-vision/code-of-ethics.html (accessed January 31, 2012).

⁷ *Code of ethics for museums*, 2000, www.aam-us.org/museumresources/ethics/coe.cfm (accessed January 31, 2012).

The future development of the project envisages a second step to integrate the mailing list of anatomical collections existing in the UMAC databases with other existing networks; moreover, the survey set of questions will be refined according to the first results and feedback from colleagues; finally, the integrated survey will be submitted to anatomical and medical museums in order to continue the collection of data.

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APPENDIX – The online survey

A. General information

1. Filling date
2. Name and e-mail to contact

B. History and type of collection

3. Type of collection
 - Anatomical
 - Pathological
 - Mix
 - Other (please specify)
4. Date of foundation
5. Founder's name
6. Primary venue of collection
(separate cabinet in university, palace or court, part of anatomical theatre)
7. Collections providers and rulers

C. Status of research connected with the collections

8. Researchers connected with the collections
 - Teacher
 - Schools and universities
 - Followers
 - Collaborators
 - Main fields of interest in anatomy
 - Impact of collection and anatomy
 - Publication
 - Journeys

D. Objects of the collections

9. Famous objects
10. Description of sort of objects
 - Natural bone models (complete skeletons or parts)
 - Wooden models
 - Clay models
 - Ivory models
 - Bronze models
 - Wax models
 - Dried models
 - Papier-machés models
 - Petrified models
 - Objects in glass containers
 - Plastinated models
 - Schemes and illustrations: printings, drawings, paintings

E. Conservation

11. Conservation strategy for the objects
 - To handle
 - To clean
 - To repair

- To transport
- To store
- To exhibit

12. Instruments for microclimate

- To measure
- To record
- To check

13. Instruments to check light radiations

14. Former conservation

F. Documentation

15. Documentation

- Databases of objects
- Databases of publications
- Websites

G. Exhibitions of historical specimens (title, venue, date, author, organizer)

16. Past exhibitions

17. Present exhibitions

H. Accessibility

18. The collection is accessible to

- Students
- Researchers
- Doctors/Nurses/PAMs
- General public/tourists

I. Contemporary anatomists and fields of interest

19. Followers

- Anatomists names
- Name of collections
- Universities

20. Contemporary main fields of research

The new communication technologies for sharing and participatory Italian university museums

ELENA CORRADINI

Abstract

Thanks to their peculiar identities linked to the specific disciplines which determined their creation, university museums offer an interesting experience to reflect on the role that the community of museum professionals and experts can engage within the production of cultural content - in particular through the use of databases of their collections - to activate social tools, and to design interfaces for contents typical of applications offered by the perspectives of Web 2.0 for the passage from information to knowledge, which is fundamental for the institutional goals of museums, that is to say 'education and study'.

The creation of an observatory on the use of Web 2.0 tools by university museums could be useful to monitor the existence and the use by university museums of social networks through an official channel.

Introduction

The approach of this project started from a research carried out on the web or the Italian university museums, that is to say an analysis of the so-called 'Italian university museums web galaxy', according to what is stated by the Recommendation Rec (2005)13 of the Committee of Ministers to member states on the governance and management of university heritage of the Council of Europe,¹ which in article 33 promotes programs and research projects that can involve professionals of many different disciplines connected with university museums, not only for conservation, restoration, inventories, but also in particular for computer systems to process data and advanced technologies.

This research showed a very diverse situation: most university museums online adopt a typical web 1.0 'broadcast model' to disseminate information, which means that content is created and distributed by the cultural institution to users through the web. Most of the investigated web sites had a low level of interaction, even if there is a significant presence of content, in response to which visitors tend to have the same passive attitude which is very common while visiting museums (KENNEDY ET AL. 2007).

A first result of this research was presented at the conference of the UNIVERSEUM European Academic Heritage Network, held at the University of Uppsala, Gustavianum Museum, in June 2010.² The research continued with a careful examination of the web sites of university museums through the tools of investigation provided by the 'museum and the web kit' realized within the European project Minerva for the creation of quality cultural web sites.³ This research allowed us to implement the project of the Italian university museums web portals, presented at the Congress of UMAC - University Museums and Collections Committee (CORRADINI 2012), within the world congress of the International Council of Museums (ICOM) in Shanghai 2010.

The issue of the contents of the web portal, with particular reference to their accessibility, has been presented in a poster at the Congress of the CIDOC – International Committee for Documentation that took place in Shanghai 2010.⁴ Finally a specific proposal for a project about the new communication

¹ [www.universeum.it/docs/RecommendationRec\(2005\)13_EN.pdf](http://www.universeum.it/docs/RecommendationRec(2005)13_EN.pdf) (accessed June 28, 2012).

² www.gustavianum.uu.se/universeum2010/Programme.pdf (accessed June 28, 2012).

³ www.minervaeurope.org/structure/workinggroups/userneeds/prototipo/museoweb.html (accessed June 28, 2012).

⁴ cidoc.meta.se/2010/abstracts.php (accessed June 28, 2012).

technologies for sharing and participatory Italian university museums has been presented at the Congress of CIDOC held in Sibiu 2011.⁵

University museums as participatory cultural institutions and the use of web 2.0

University museums are real and virtual places where institutions serve as 'platforms' to connect different visitors/users that act as creators of contents, distributors, consumers, critics and collaborators; visitors/users can connect, create, share, learn in a reciprocal way but also around the content; science is born from citizens, both individuals and networks of individuals who are not necessarily being scientifically trained, but interested or curious in performing or managing research-related tasks on cultural contents such as observation, measurement, or computation (LIN 2007; MCLOUGHLIN & LEE 2007; MURUGESAN 2007; PRATI 2007).

Thanks to their peculiar identities linked to the specific disciplines which determined their creation, university museums offer an interesting experience to reflect on the role that the community of museum professionals and experts can engage within the production of cultural content - in particular through the use of databases of their collections - to activate social tools, and to design interfaces for contents typical of applications offered by the web 2.0. (BARKSKY & PURDON 2007; SHNEIDERMAN 2008; ULLRICH ET AL. 2008; METITIERI 2009). It is necessary to take into consideration also the perspectives of Web 2.0 for the passage from information to knowledge, which is fundamental for the institutional goals of museums, that is to say 'education and study'.

This new set of standards and services - which is very easy and intuitive as well as free to produce - can be a useful tool to provide and share online text content, photographs, audio-visual material, constructed and manipulated by museum professionals also in collaboration with the users, in order to give a wider visibility and diffusion to university museums heritage (GIBSON 2007; O'REILLY 2007; SHUEN 2008).

The use of web 2.0 tools, which allow the direct intervention of users in creating and sharing content, promotes the participation of publics and a fluid approach to university museum information, which means a greater openness and sharing in order to spread the knowledge (D'OTTAVI 2006; CHUI ET AL. 2009; FERRI ET AL. 2009). Moreover, web 2.0 tools activate pathways of social learning, where the flow of knowledge is not unidirectional but in all possible direction, according to a knowledge conception which is not hierarchical but rather democratic (GALLINO 2007; CHADWICK 2009).

The role that the museum traditionally acts is not only as a repository for unique and fascinating objects but also as the location of the situated knowledge that these objects imbue.

By reflecting on the dynamics related to a possible change of the way in which we use internet to access cultural content of university museums on the web, it is possible to state that internet and new communication technologies - unlike traditional media that have a recognized authority but also are somehow closed - promote a liquid approach to information, that is to say a greater openness and sharing in spreading knowledge. In the last years, the development of web 2.0 has allowed to activate participative attitudes among users in the creation and sharing of contents (FU ET AL. 2008).

The services of social web are changing our way of communicating of creating social and individual spaces, of taking part, of learning, of being creative and can change our way to use and experience cultural heritage of university museums (ROLLETT ET AL. 2007; ANKOLEKAR ET AL. 2008; BOJÄRS ET AL. 2008; SPINAZZÉ ET AL. 2009; AHRENS 2011).

⁵ www.brukenthalmuseum.eu/cidoc/uk/file/abstracts.pdf (accessed June 28, 2012).

As Simon (2010, preface) stated,

“rather than delivering the same content to everyone, a participatory museum collects and shares diverse, personalized, and changing content co-produced with visitors. It invites visitors to respond and add to cultural artifacts, scientific evidence, and historical records on display. It showcases the diverse creations and opinions of non-experts”.

Web 2.0 presents itself as a multichannel model that crosses distributed networks and connects people among them and museums with their users. In a web 2.0 world end users not only expect to take on an active role during their online browsing but also a pro-active role in the production of their own micro-content (AJJAN & HARTSHORNE 2008).

Web 2.0 approach aims at modifying the communication model based on a lack of symmetry between sender and receiver: the web, therefore, makes society become more horizontal. This feature influences also the way in which cultural contents are produced by university museums, like any other cultural institution, since anyone can become author increasing the amount of knowledge potentially available on the web and its quality.

Multilateral communication tools characterize the web 2.0: they support an open and fluid approach to information in order to spread the community of university museums, to promote the participation of audiences and social inclusion, to involve audiences in the interest for cultural heritage which becomes relational, experiential, emotional. In fact, anybody can be author and increase the amount of knowledge potentially available on the web (SCOTTI & SICA 2007).

The growing importance of sharing information and knowledge and the approach to user-generated content represent a great opportunity but at the same time a challenge for the renewal process that involves not only promotion and communication but the entire organization of university museums, in order to be actually participatory and able to activate a dialogue between the scientific community, the museum professionals and a wider audience (CRAIG 2007; EBNER 2007).

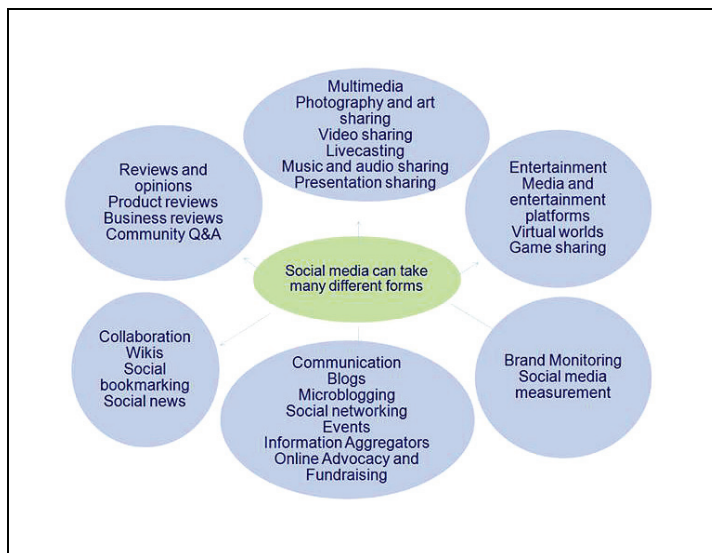


Fig. 1 - The big potential of users generated contents and the users created

The users generated contents have a great potential, like the use of tagging as a form of communication. Users can associate keywords to objects, texts, pictures, videos, audios to create folksonomies. The phenomenon of folksonomies, that is to say the taxonomies designed in a participated way by the Internet communities, can therefore add some important elements to the structure of museum catalogue databases, contributing to the education with brand new functions for cultural heritage. They can provide useful data for classification/documentation of the objects to join to the traditional cataloguing but also to explore the

use of social software in digital narrative research in which tagging is a form of communication for a narrative common ground.

An innovative form of cooperation among colleagues, users, friends, and potential partners is crowdsourcing, that is to say the opportunity to outsource certain activities to a community through an open call. It represents a challenge to carry on traditional activities in a different way, since it faces traditional methods of scientific authority by exploiting internal and external creativity of users, stimulating their motivational factors like enthusiasm, being part of a group, generosity, willingness of sharing knowledge and by increasing their sense of responsibility and public domain and therefore reaching goals that we would have never thought to gain with limited resources: accuracy and quality are guaranteed thanks to the caring for reviewing procedures.

Crowdsourcing can be a useful resource for the collections: for their classification, by gathering descriptive metadata related to objects - social tagging is a well-known example; for their contextualization, by adding contextual knowledge to objects, e.g. by telling stories or writing articles/wiki pages with contextual data (ALEXANDER & LEVINE 2008); for their completion by actively pursuing additional objects to be included in a (web) exhibit or collection; for corrections and transcription tasks, by inviting users to correct and/or transcribe outputs of digitization processes. Moreover, crowdsourcing can be applied to exhibitions: for co-curation, by using inspiration/expertise of non-professional curators to create (web) exhibits; for financial support – crowdfunding – that is to say collective cooperation of people who pool resources to support initiatives promoted by others

In this scenario, the hierarchic structure of knowledge gives way to a democracy of knowledge. The thing that distinguishes new platforms or social networks like Facebook, Twitter, YouTube, Flickr or MySpace and states their success on the web is the level of sharing while creating contents, which are immediately available to other users that share their interest or competence fields.

The use of web 2.0 tools can promote different multimedia communication strategies to valorize the activities of museums for the discussion and diffusion of new contents linked to specific or temporary projects like the applications for iPhone, iPod Touch, iPad which can be used also as town guides for museums or as GPS navigator in cultural visiting paths. Moreover, they can help in interpreting the online audience of university museums, which is quite difficult to measure and to foresee but fundamental to design the strategic plan of a university museum.

An observatory on the use of Web 2.0 tools by university museums

The creation of an observatory on the use of Web 2.0 tools by university museums could be useful to monitor the existence and the use by university museums of social networks through an official channel; to verify the presence of user-created contents on university museums published on the web through Web 2.0 tools; to collect, study and evaluate university museums specific needs for the use of Web 2.0 tools but also to share information and good practices for the use of Web 2.0 tools; to publish reports about the presence and the use of web 2.0 tools by university museums.

As first phase of this project, we thought it could be useful to create an online survey (see appendix) addressed to the Italian university museums recorded in the POMUI database.⁶ In the second phase of the project, the survey will be addressed to European and international university museums recorded in the international UMAC Worldwide Database of University Museums & Collections.⁷

The self-evaluation survey is based on the Minerva project questionnaire to design a user-centered web application referring in part to the check-point of the *Handbook for quality principles* published in the *Handbook on cultural web user interaction*.⁸

⁶ www.pomui.unimore.it (accessed June 28, 2012).

⁷ publicus.culture.hu-berlin.de/collections (accessed June 28, 2012).

⁸ www.minervaeurope.org/publications/handbookwebusers.htm (accessed June 28, 2012).

The main purpose was to evaluate the relationship between university museums visitors and their web applications. Moreover, we added a specific section to evaluate the use by university museums of tools and of collaborative and sharing potential that characterize Web 2.0. It has been submitted to twenty university museums of thirty Italian universities, in order to evaluate their level of interaction with users and the possibility to find out advanced interaction opportunities.

The questionnaire is structured of six sections. The first one aims at verifying the different cultural subjects, their management and the type of their web application: the results show that one third of them is managed by a department and a university museums system, not all of them are cited in the statutes of the universities, not all of them have a regulation, most of them have a static web site with a few interaction with their audience.

The second set of questions aims at evaluating the usability of the web application according to four different aspects: effectiveness, accessibility, multilingualism, privacy. The data show that one third reflects the target audience of the museum; concerning effectiveness, few of them have paid attention to the users' need in terms of category of contents; most pay a lot of attention to the principles of accessibility, while less attention is given to multilingualism. Much attention is dedicated to the data protection policy.

The third section aims at verifying the parameters to profile users and the customization opportunities of web applications. The results show that museums don't provide a particular user's profile and that the contents are mainly thought to be used to plan a visit, search in the catalogues and look for educational materials; all the thematic areas are taken into consideration without any specific difference.

Concerning the fourth section which evaluates advanced interaction and interactive services, data collected state that the most popular is the mailing list (fig. 2) and that users side services are not very much used.

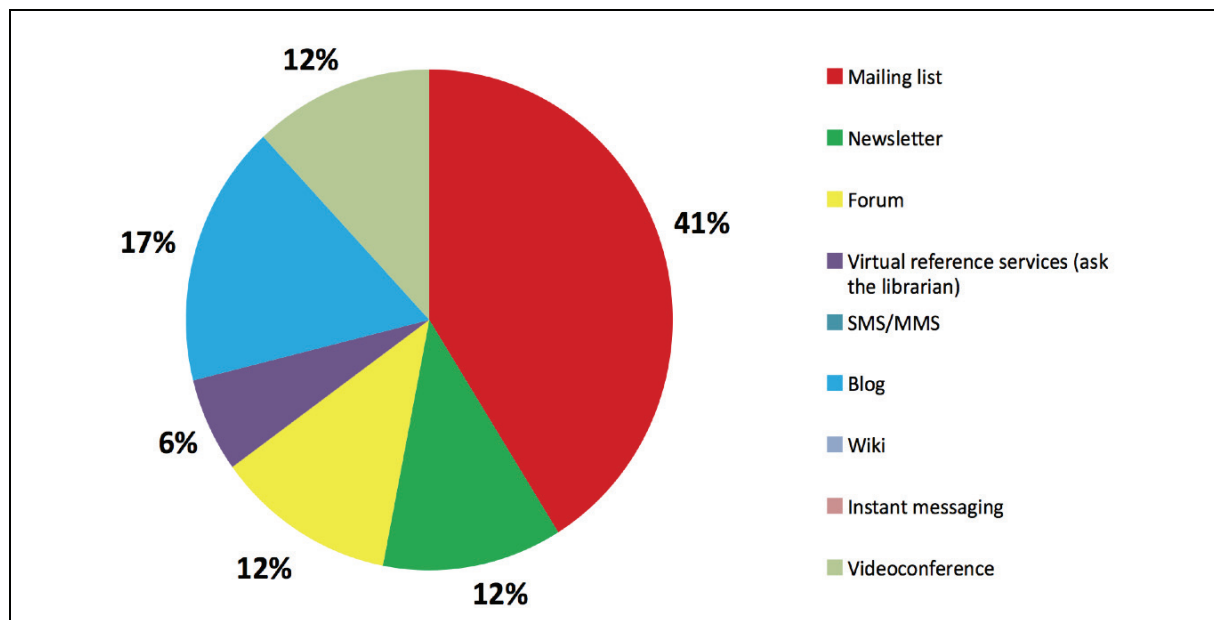


Fig. 2 - Interactive communication services

Concerning the share of contents with other web sites, the most popular is Facebook followed by YouTube and Google Maps (fig. 3).

The fifth section studies users to evaluate the audience and its satisfaction. Data show that museums prefer the online distribution of reports to spread the results of their activity to their audience.

Finally, the sixth section is dedicated to the use of social network by university museums. In particular: how long the museum has had its profile on social networks; how difficult it is to get to know the

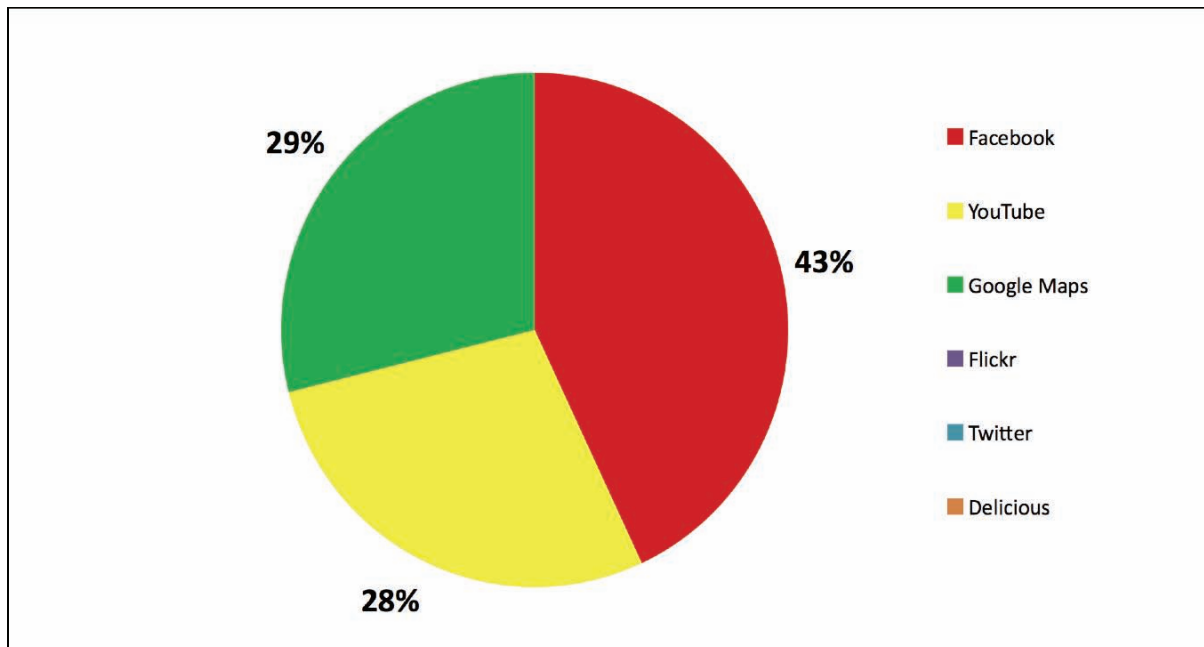


Fig. 3 - Sharing resources with other web sites

museum through social networks; the different uses of the social networks; how many friends/links/followers the museum has on the social networks.

Concerning the museum official profile on social networks, very few are using Facebook and YouTube; most of them still don't use a dedicated profile on social networks even if the majority of them thinks that getting to know the museums through social networks is quite simple for users (fig. 4).

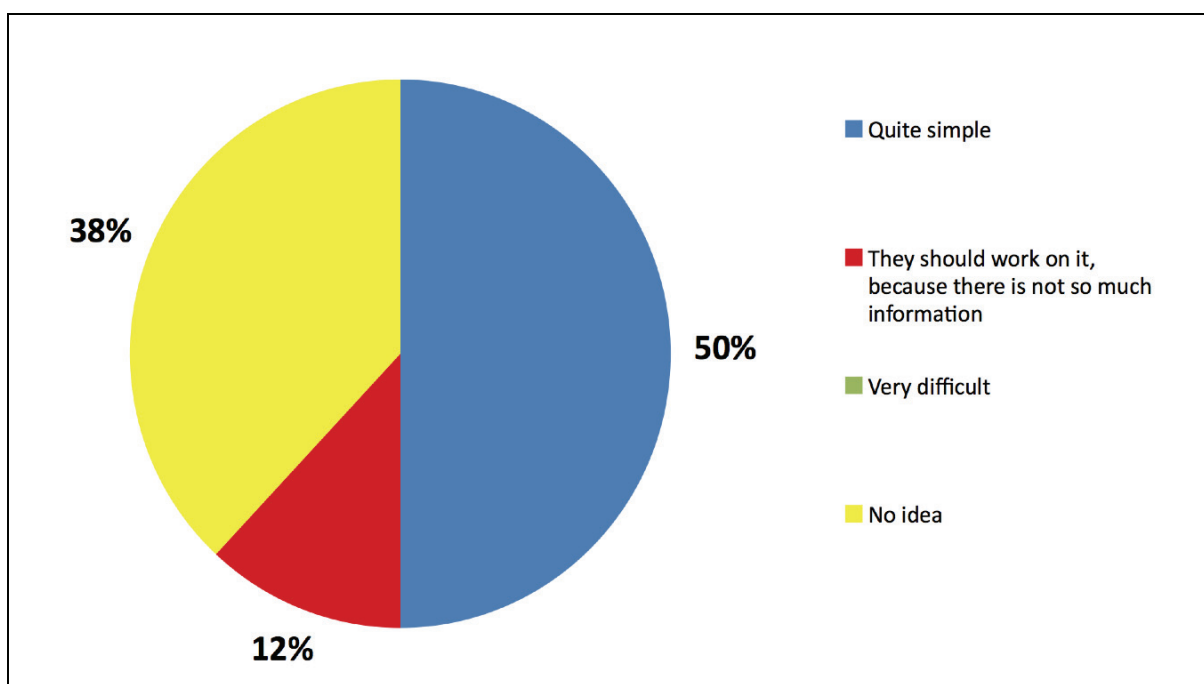


Fig. 4 - Getting to know the museums through social networks

In general, the majority of them thinks that Facebook and YouTube are useful to keep in contact with regular visitors, but at the same time to look for new contacts. The ones which activated an official profile already have a good number of contacts and followers.

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APPENDIX – The online survey

SECTION I – The cultural subjects, their management and the type of web application

1. Type of cultural subject

- Museum
- Collection
- Library
- Archive
- Training and research centre
- Cultural project, portal, digital library, cultural-touristic portal
- Temporary exhibition
- Other (specify)

2. Management

- University center
- Interdepartmental center
- Coordinating authority
- Department
- Department/interdepartmental center
- Department/coordinating authority
- Department/University museum system
- Faculty
- Institute
- Museum/University
- Museum pole
- University museum system
- University museum system/Foundation
- University museum system/pole
- University
- University/Board
- Other (specify)

3. Presence in university statutes

- Yes
- No
- Other (specify)

4. Has the museum a statute/regulation?

- Yes, a statute
- Yes, a regulation
- Yes, both
- None
- Other (specify)

5. Type of web application (to be) developed

- Static web site
- Dynamic web site (using CMS)
- Web application
- Forum
- Blog
- Wiki
- Web portal

- Database management system
- Informative system
- Web service
- Online social network
- Web game
- Other (specify)

SECTION II – Evaluation of the quality of the web application in relationship with the user experience

6. Users evaluation strategy

- Dedicated user/panel group
- Group of users = target audience
- Presence in users group of all the target audience
- Analysis by the users of the web prototype
- Communication of the concept and objective to users group
- Satisfaction analysis
- Documentation and inclusion of the analysis in the design process of the application
- Analysis confirmation in the prototypes
- Other (specify)

7. Effectiveness

- Have group of users or other categories of users been asked about the category of contents which could make the web application more effective for them?
- Were there formal criteria for content to be taken into account and to follow, in order to reflect the requirements of the target audience?
- Other (please specify)

8. Accessibility

- Design to support universal access
- Respect of national regulation on ICT
- Respect of W3C WAI guidelines
- Automatic or semi-automatic tools evaluation
- Access through a wide variety of content distribution channels
- Sense and value without images
- Use of proprietary applications or plug-ins
- Support of different types of browsers
- Support of portable and mobile devices
- Support slow internet connections
- Other (specify)

9. Multilingualism

- Multilingual design
- Declared policy on multilingualism
- Analysis by experts and groups of users against this policy
- Mission, identity and profile of contents available in several languages
- Contents in the language of signs
- Contents in non-EU languages
- Dynamic contents available in more than one language
- Static contents available in more than one language
- Web site structure separated from the language
- Other (specify)

10. Privacy

- User behavior code
- Do users have to subscribe to it?
- Protection of the overall database and of its contents
- Preventive measures to limit non-authorized exploitation of contents
- User data protection policy
- Clearly expressed to final users
- Are registrations of access and users data kept?
- Are these registrations necessary?
- Respect of laws and regulations on personal data protection
- Are contents available with Creative Commons licenses?
- Other (specify)

SECTION III – Verifying the parameters to profile users and the customization opportunities of web applications

11. Organizing contents according to users profiles

- Generic public
- Students
- Teachers and personnel
- University students
- University professors and personnel
- Researchers
- Professionals
- Librarians
- Journalists
- Tourism operators
- Public administration employees
- ICT professionals
- Children
- Teenagers or young adults
- Parents
- Providers
- No, I don't want to organize contents according to users profiles
- Other (specify)

12. Organizing contents for different activities

- Plan a visit
- Catalogue search
- Research of educational materials
- Buy
- Games
- No, I don't want to organize my contents according to roles
- Other (specify)

13. Organizing contents on thematic areas

- Botany
- Mineralogy
- Petrology
- Planetology
- Paleontology

- Zoology
- Anatomy
- Anthropology
- Medicine
- Photography
- Archeology
- Arts
- Physics
- Technological and scientific heritage
- No, I don't want to organize my contents according to thematic areas
- Other (specify)

SECTION IV – Evaluation of advanced interaction and interactive services

14. Interactive communication services

- Mailing list
- Newsletter
- Forum
- Virtual reference services (ask the librarian)
- SMS/MMS
- Blog
- Wiki
- Instant messaging
- Videoconference
- Streaming
- Other (specify)

15. Learning interactive services

- Tutorial on-line
- Help online
- Interactive virtual visits
- Other (specify)

16. Commercial interactive services

- E-commerce
- Ticket office
- Reproductions
- Other (specify)

17. Interactive forms

- Subscriptions
- Reservations
- Other (specify)

18. User-side services

- Feed RSS
- Podcasting
- Social bookmarking
- Social tagging/folksonomy
- File sharing (texts, images, videos)
- Mash-up
- Storytelling
- Interactive games

- Masterpieces on your desktop
- Add a comment
- Send a friend
- Vote and surveys
- Save the research
- Travelogue service
- Agenda or personalized calendar
- Personalized map
- Personalized visiting plans
- Personalized web gallery/ Virtual curator
- Virtual postcards
- Learning environments
- Other (specify)

19. Sharing resources with other web sites

- Facebook
- YouTube
- Google Maps
- Flickr
- Twitter
- Delicious
- Other (specify)

SECTION V – Measuring users to evaluate the audience and its satisfaction

20. Evaluate needs and satisfaction of users

- Web analytics
- Meter
- Standardized questionnaire
- No, I'm not interested in measuring the audience
- Other (specify)

21. Choosing the persons for the interview

- By chance
- Raising a panel of volunteers
- Choosing an a-priori panel of volunteers
- Other (specify)

22. Interview methods

- By phone
- Personally
- Leaving a form at the desk, during conferences, etc.
- Via e-mail
- Through an on-line interactive form
- No, I'm not interested in interviews
- Other (specify)

23. Reward for those who will answer

- Giving the opportunity to enjoy a service
- Giving a free gadget
- Inviting people to take part to an initiative
- No, I'm not interested in rewarding those who respond
- Other (specify)

24. Disseminating the results of the interviews

- Distributing a printed report
- Distributing an online report
- Publishing FAQ online
- No, I'm not interested in publishing the results
- Other (specify)

SECTION VI – The use of social networks by university museums

25. How long has the museum had its profile on social networks?

(2 months; 6 months; 1 year; 2 years; 3-5 years; > 5 years)

- LinkedIn
- Facebook
- YouTube
- MySpace
- Flickr
- Windows Live Space
- Twitter
- No profile on S.N.
- Other (specify)

26. How difficult is it to get to know the museum through social networks?

- Quite simple
- They should work on it, because there is not so much information
- Very difficult
- No idea
- Other (specify)

27. Different uses of the social networks?

- Keep in contact with regular visitors
- Keep in contact with visitors that attend the museum occasionally
- Looking for new contacts
- Organizing activities with the contacted persons
- Promoting initiatives and spreading information
- Other (specify)

28. How many friends/links/followers has the museum on the social networks?

(0; 1-10; 11-50; 51-100; 101-150; 151-200; 201-250; 251-300; 301-400; > 400)

- LinkedIn
- Facebook
- YouTube
- MySpace
- Flickr
- Windows Live Space
- Twitter
- Other S.N.
- Other (specify)

Making the museum visible: Reinventing a veterinary museum

ISABEL GARCÍA FERNÁNDEZ, SONIA DÍAZ JIMÉNEZ & GABRIEL MARTÍNEZ GARCÍA

Abstract

The Veterinary Museum, Complutense University, Madrid, is an interesting example of institutional adaptation. From its establishment, it has had to reinvent itself in response to political, social, economic and academic circumstances. It was created at the end of the eighteenth century to house teaching and research collections that were much appreciated at that time. However, the museum history is full of losses and recoveries.

Rebirth in the twenty-first century; a new plan was developed taking into account the academic environment and seeking public recognition. The Animal Hospital belonging to the veterinary faculty was chosen for its museographic installations so its contents are very accessible to the public.

Introduction

The Veterinary Museum is now one of the numerous and varied museums and collections owned by the Complutense University of Madrid. The university has a vast heritage, but due to its size as an institution it has not been very efficient in some aspects, for example, in the documentation, care and accessibility of its heritage. The different departments have been responsible for taking care of their collections, which are used mostly for teaching; some of those collections became museums in the second half of the 20th century and others in the 21st century, which is the case of the new Veterinary Museum. At present we are witnessing the birth and growth of an institution, a very exciting process since it implies digging and hunting for objects and collections in our own place of work. We are finding real treasures and receiving new donations to enrich its contents.

The Veterinary Museum is the Complutense University's most recent museum. It is in its early stages and will emerge into the public eye very soon. However, this institution and some of its collections have a long history.

A brief history

Veterinary studies in Spain started in the 1792 with the foundation of the Royal Veterinary School of Madrid along the lines of the French model. A vast heritage was accumulated around these studies, most of which was used for teaching and research.



Fig. 1 - The old Anatomy Museum (ca. 1905)

At the beginning of the 19th century an important part of the collection was lost due to political circumstances: the Spanish War of Independence (1808–1813), French occupation and lack of interest shown by governing institutions afterwards. However, in 1827 a renewed interest in veterinarian instruction emerged and a number of academics began to gather collections for teaching.

The school grew and moved to different locations (between 1864 and 1881). At the same time its collection

was also growing. By 1881, it was located in a large building in the centre of Madrid and stayed there for almost 80 years. This period is considered to be the richest in terms of expanding collections, with items such as anatomical models, biological specimens and preparations, skeletons, books, prints, etc. being acquired. In addition, scientific cabinets and academic chairs kept significant collections. Then, an important anatomy and teratology museum came to light and had a high profile. The exact date when the museum was set up is not known, but pictures taken in 1905 have been found and documents dating from 1916 refer to the anatomy museum.

During the Spanish Civil War, which took place from 1936 to 1939, the museum was badly damaged and consequently a significant part of the collections was lost. However shortly after the end of the war the collection was recovered and the museum was opened again under the name Museum of Veterinarian Anatomy and Teratology (ca. 1942).

In 1958 the school in downtown Madrid was closed and the last move took place. This was the worst episode in the history of the collections, as a large number of objects and specimens disappeared, some were dispersed and others were sold at the flea market. The rest of the collection was kept provisionally in storage in classrooms in the law school belonging to the Complutense University.

In 1968 the new veterinary faculty buildings were opened and the collections found their way to the anatomy chair, although the contents were insufficient for creating a museum. At the same time, the surgery chair rebuilt a collection of medical and clinical equipment.



Fig. 2 - The collections were kept in storage in inappropriate spaces.

It can be said that in barely five years 3,000 pieces with great historic and scientific value were rescued and gathered together: horseshoe collections, anatomical models made of wax, plaster or papier-mâché (18th and 19th centuries), surgical and professional instruments, including those donated by individuals such as the first Spanish veterinary surgeon. These impressive collections were considered good news but this was counteracted by the lack of space needed to store them.

As we were present at the creation of the museum, which is still under construction, we had the chance to define the objectives, select the collections and develop a museum project in line with its mission statement. Due to the great number of pieces coming in, we needed to evaluate their

The new museum

First step: Documentation

Things did not change much for a long time, and it was well into the 21st century before the new project could be started. In 2003, Professor Sánchez de Lollano was in charge of the history of veterinary studies chair.¹ In 2005 he began an intensive work of heritage recovery, adding his own collection and attracting donations from other veterinary surgeons, academics and students. The teaching collections of the anatomy and surgery chairs were also included along with collections coming from other related institutions. It

¹ Also in March 2003 important documents were discovered in the archives of the veterinary faculty representing a major contribution to the history of science in Spain.

significance and justify their inclusion in the museum. All the acquisitions were registered and analyzed in order to determine their state of conservation so we could act accordingly.

The heritage collected is very heterogeneous and in order to proceed with documenting the collections, it was also vital to establish priorities based on the value of the object or group of objects, their potential use and their conservation needs.²

The evaluation criteria took into account:

1. The artistic or symbolic value placed on decorative arts and objects with recognized artistic significance.
2. Scientific or technical heritage values; a sub-category will include professional value referring to the scientific instruments used in veterinary practice. This assessment takes into account age, unusual features and also if the objects contain information about a specific technique or scientific theory, or if they provide significant data about an institution.
3. Academic value applied mostly to the older collections dating from the 18th and 19th century, including anatomical models, mannequins, scientific instruments and preparations that also have historic significance.

Some objects have more than one value attached to them: artistic, academic, professional, scientific, etc.

Priorities are also based on conservation considerations: state of completeness, state of deterioration and conservation needs.

In the process of assessment we came across two special situations: many objects are duplicates or are very similar, especially instruments used by veterinary surgeons working between 1930 and 1970. We have decided that these objects will be kept in storage and be used for future donations or exchange.

On the other hand, a number of historical objects are still used as teaching materials, but some of them have great historical and artistic value. We consider that this is incompatible with their conservation and exhibition, so the production and use of replicas is being proposed.

Second step: Exhibition

The process of building the museum involved trying to find locations to keep the collections safe but accessible. Here we have to face interesting challenges, since no particular areas were designated for the museum. We had to search for the most suitable available space, and this task became a difficult mission.

Finally, the museum will be established in three locations:

1. Public exhibition: artifacts and specimen selection is based on their significance and state of conservation.
2. Visible storage: with restricted access where a representative number of objects will be kept.
3. Storage: where less significant collections will be kept, including duplicates and those in a poor state of conservation.

² An intern was assigned to the museum to help with documentation but this was clearly insufficient, however a great deal of work was done which was described in two publications: RODRÍGUEZ VARELA ET AL. 2009 and RODRÍGUEZ VARELA ET AL. 2010. Work is still ongoing today thanks to the hard work of researcher Celia Rodríguez.

We began working on the exhibition of the collections in 2007, when the veterinary and fine arts faculties started to collaborate in several research projects. These consisted of museological plans and a new museographic installation and included conservation proposals (the team includes an architect who works in exhibition design, professors of conservation and a museum and museography professor. Later on two graphic designers also agreed to take part)³.

We chose the animal hospital as the first exhibition space for the museum; the installation is now complete and open to the public. It seems a strange place for a museum but this decision was taken in response to an urgent situation: the lack of space to house the collections, which were dispersed in different buildings with a high risk of deterioration. Also, we knew about the existence of possible donations that would be lost if we did not act fast (many of the donors had heard about the museum years ago but did not believe it would come to fruition). The hospital offered enough space and opportunity for students and the general public to view the collections.

The exhibition is thematic and follows a rational coherence; also the objects are grouped by materials wherever possible. Accessible display cases allow collections to be changed on a regular basis.

Three display cases were designed and placed in the hall of the hospital, near the waiting rooms and close to the veterinary surgeon offices. We have placed a selection of the collections here to give a general view of the contents of veterinary science and practice, topics widely represented in the museum. Of course, we took into account conservation concerns, meaning that delicate items were not included, especially those sensitive to light and humidity fluctuations. A large number of people pass through this area (more than 200 people visit the hospital every day) and they seem very interested and curious about the objects displayed.



Fig. 3 - Showcases placed at the animal hospital hall and corridor.

The second display area is in the corridor of the hospital's main floor. It is also a public space but is less accessible for visitors, although many academics and students pass by every day. We have placed five smaller display cases here with a selection of objects and specimens

representing different departments or academic units: 1) osteology, embryology and teratology collections from the Department of Anatomy and Comparative Pathology, 2) the domestic parasites collections from the Department of Animal Health, 3) the teaching collection of the agricultural unit in the Department of Animal Production, 4) food packaging collection from the Department of Nutrition, Bromatology and Food Technology and 5) the collection from the zoology unit of the Department of Animal Physiology.

In this space there is abundant natural light, so we blocked it with blinds that also serve as information supports on which general information about the collections has been printed in both Spanish and English. This exhibition has been financed with money received from research projects, private companies and institutions. We have also received public funding from the faculty and the university.

³ We are also currently carrying out conservation research on some collections such as the Auzoux models. We found out that we had one of the most comprehensive collections in the world of Auzoux anatomical models. No restoration work has been done on them since they were made, although they were heavily used and some of the models need urgent restoration treatment.

At present, we are working on the next exhibition area in the basement of the animal hospital. It is a temporary space, although we are aware that in these difficult times temporary is likely to become permanent.

Visible storage

This space has been conceived as a place to keep the majority of the collections and to secure their conservation, security and accessibility. It is a visible storage area designed to be fully accessible and appealing to the public, students and researchers.

Located in the basement of the animal hospital, the space is not very large, barely 80 square meters in which we have to accommodate recycled display cases and stored furniture. We are conscious that the chosen space is not the most suitable one for storing and exhibiting heritage collections. Nevertheless, we have to take decisions and face problems that demand complex solutions. With a very low budget we were able to equip the space to make it suitable for the museum and attractive as an exhibition space. However, after finishing the renovation work mishaps prompted a reassessment of the project: the building was found to have suffered structural damage which turned out not to be as serious as we thought. We decided to continue with the project but safety regulations meant that the authorities had to place a net under the plaster ceiling. Environmental conditions have been monitored regularly and we have found that temperature levels are very stable and humidity conditions are

slightly higher than in the previous locations, making it more suitable for most of the collections.



Fig. 4 - Visible storage and exhibition space before the official opening.

The exhibition furniture has been placed using practical criteria over and above aesthetic considerations. Selecting the collections to be shown in this space (more than 700 items) was done according to different themes: instrumental, clinical laboratory equipment, anatomical models and artistic objects connected with teaching or veterinary practice. Most of the objects and specimens moved to the visible storage facility are made of resistant or stable materials and are generally in a good state of conservation. However, some

pieces are very fragile; these are anatomical models made of wax and in poor condition, requiring the collaboration and supervision of a restoration team from the Fine Arts School.

Access to this space follows two patterns:⁴

Free visits: the museum can be seen from the outside through a glass inner door that allows a general view of the whole exhibition space. Different information supports are available here, providing appropriate information about the contents.

Guided tours: the public, students and researchers can wander around the space and see the objects up close. The museum staff describes the collections adapting the explanations to suit the various groups and their interests. This type of visit allows direct contact with some of the objects and the

⁴ These are based on the proposals of John D. Hilberry "Peek-In" or "Walk-Through" (HILBERRY 2002, 36–37).

visitors' experience is more satisfactory in general terms. Information about the contents can also be found on brief information labels and information panels placed alongside significant collections.

The exhibition in this space is permanent, although the option of rotating collections is being considered, enabling visitors to see more of the wide variety of collections.

Future: The Complutense University Museum?

This is our challenge for the next decade: to open up the permanent collection, including a visible storage area housed in a better and more suitable space. This, however, gives rise to new dilemmas: how to deal with a rapidly growing collection and what to do about current problems. The solution is a new museum building. The university received a large building from the Ministry of Culture which currently houses the National Costume Museum (formerly the National Contemporary Museum). The initial idea was to move the university collections there (fifteen museums and more than fourteen collections) and to open a Complutense University Museum. Some departments disagree with this idea since their collections are really teaching collections and are in constant use. Other departments have their own well-established museum in their own buildings and are afraid that the context of the collection will be lost.

This is a difficult issue for us to resolve, as we know that a better space for the museum will be gained, with new facilities, equipment and even public access. We are sure that the essence of the collections will be resented in this general context. We are currently still at the negotiation stage, and financial problems will further delay the project.

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Private donations and the collecting legacy of Luis Simarro to the heritage of Complutense University of Madrid

MARÍA DEL PILAR AGUILAR, IRENE CALVO & MARÍA DE LOS ÁNGELES MÉNDEZ

Abstract

One of the most important private donations in the Complutense University of Madrid is Luis Simarro's legacy. The Simarro Foundation was formed in 1927 with a collection of paintings by Simarro's friends such as Sorolla, Berruete, Madrazo and prints by Dürer and Goya. In 1945 this legacy became part of the art collection of the General Foundation of Complutense University. Now its current location in the Faculty of Psychology does not fulfill all the requirements about conservation because it is not guarded by specialised staff.

The management of university collections strongly depends on the general budget and Unidad Técnica de Cultura is working in order to achieve a balance between human and material resources.

Complutense University of Madrid museums and collections

Museums and collections that round off the heritage (historic, artistic and scientific-technical) of the UCM came up from teaching and research. These include an important artistic legacy that was collected by Cisneros in 1499. This artistic legacy was formed of important collections of artistic works, scientific and technical instruments and ethnographic materials.

Many of the museums and collections at the Complutense University of Madrid have been formed by private donations. Typical donors are usually university teachers or people who want to leave their interesting legacy in a research atmosphere and preservation.

There are two types of private donations in the Complutense University: donations that come from private individuals and donations of pieces that come from other collections or museums. The latest private donation that Complutense University has received is an important collection of optics from which Optics Museum has been created. Histology Museum, Museum of Dentistry, Veterinary Museum, Museum of Entomology and José María Prieto Collection of Japanese art are museums that were created from private donations.

The Complutense University of Madrid has a lot of cultural and natural heritage that is enclosed in their university departments. This heritage is undervalued but it could be used to increase university prestige and to access to research and training of students.

The Complutense University of Madrid has 14 museums and 14 university collections but they have little citizen impact.

The main problem that Complutense collections and museums are facing is the little attention from university governments. The staff of the Unidad Técnica de Cultura and the heads of museums and collections split their activities between university teaching and administrative work. They also face the loss-making training in conservation and museology and the university financial resources.

Museums and university collections like Luis Simarro's legacy are complied with the Spanish laws¹, autonomous regions² and university³ whose functions are:

¹ Ley 16/1985, de 25 de junio. Ley del Patrimonio Histórico Español.

² Ley 9/1999, de 9 abril 1999. Ley de Museos de la Comunidad de Madrid, Ley 10/1998, de 9 julio. Ley del Patrimonio Histórico de la Comunidad de Madrid.

³ Reglamento de Museos y Colecciones del Patrimonio Histórico de la UCM, aprobado en el Consejo de Gobierno de la UCM del día 22 de Julio de 2009. portal.ucm.es/web/museos/normativa (accessed June 2, 2012).

- Define organization and operation guidelines for museums and collections
- Promote awareness of heritage
- Make reports on bequests, inheritances, legacies, acquisitions
- Authorize the organization of temporary exhibitions

In the case of the Complutense University of Madrid the legal laws that control its museums and collections do not require to have a number of technicians which manage the Unidad Técnica de Cultura. There currently works three specialized government employee and three scholars. There also are six government employee but they have not any training in conservation or museology so they cannot contribute to the management of university heritage. The lack of qualified staff and the small budget are two big obstacles that Unidad Técnica de Cultura should save.

Luis Simarro: professor, psychologist and art collector

Short biography of Luis Simarro (Rome 1851–Madrid 1921)

Luis Simarro Lacabra was born in Rome in the year 1851. His father, Ramón Simarro Oltra, who was an artist, was awarded a grant for the development of a papal portrait in this city. Unfortunately, Ramón caught tuberculosis (TB) and he was thirty three years old when he died. His wife, María Lacabra, was not able to put up with her husband passing and she took her own life (LÓPEZ 2007).

Luis was only three years old when he returned to Spain and was welcomed by his uncle. He put him in touch with artists such as Madrazo brothers, whose relationship became very narrow. Years later he maintained good relationship also with Emilio Sala Francés and Joaquín Sorolla and during his studies in the high school, he had a great relationship with Vicente Boix, who strongly influenced young Simarro.

Luis studied medicine in Valencia University and he graduated in Madrid in 1875, at time in which discussions were held in the Ateneo of Madrid over the inheritance of Krausism. *Revista contemporáneo*, directed by J. del Perojo, pointed at positivism as being the most audacious and frightful of all potential heirs. At this time, a young and newly arrived man transformed the conditions of the discussion, which no longer assessed the danger that positivism might pose to Hegelians, Krausians and spiritualist (CARPINTERO 2003).

Luis Simarro started working at the Museum of Anthropology and then he got a position as director of the mental hospital of Santa Isabel in Leganés, Madrid. However, he resigned in 1879 because of conflicts with the clergy.

Simarro started to collaborate in the Ateneo as a member of the board of directors and as a teacher. He also taught at the Institución Libre de Enseñanza. It was founded in 1876 by a group of professors (Francisco Giner de los Ríos, Gumersindo de Azcárate and Nicolás Salmerón) (FUNDACIÓN GINER DE LOS RÍOS 2011). All of them were separated from the university for defending the freedom of chair and they refused to fit the education to the official dogmas: religion, politics or moral doctrines (CARPINTERO 2002).

In 1880 he travelled to Paris to study the new method of Golgi's dye and many years later Luis Simarro became Santiago Ramón y Cajal teacher (who was awarded the Nobel Psychology and Medicine Prize in 1906 and he shared this award with Camilo Golgi).

In 1902 Luis Simarro took possession of the chair of experimental psychology.

"The above mentioned chair of Experimental Psychology belonged to the School of Sciences, and it had to offer a course of psychology for graduated students coming from various faculties, such as the Schools of Medicine, Sciences and Philosophy" (CARPINTERO 2002).

There are many testimonies of the Simarro's work as a teacher. He used to remain long time with his pupils, in his house or in class, he had a long chat with them. Because of this, his research activity was reduced.

One of Simarro's students, J. V. Viqueira, gives us this interesting insight: "He was a great teacher, inside and outside the classroom. The students met him out of the class very often and, during long conversations, in which all the topics of human knowledge might be discussed, in a true philosophical spirit, all of us found all kinds of suggestions and ideas" (CARPINTERO 2003).

Simarro's art collection and the Complutense University of Madrid



Fig. 1 - Luis Simarro by Joaquín Sorolla y Bastida. Oil on canvas, 46 x 53 cm © Universidad Complutense de Madrid

Along his life, Luis Simarro accumulated an important collection: drawings of his father, own drawings, and friends' gifts. After his death he left the Complutense University this valuable collection and a large sum of money. Those goods allowed it to create a foundation that stimulated the psychological research, which was the main discipline of Simarro's life.

The decision of donating an important collection of art and giving money helped to create a laboratory of science psychology and some other improvements and facilities. Luis Simarro heritage and the General Foundation of the Complutense University were essential to create the Faculty of

Psychology in Somosaguas Campus, where there is now a great part of Simarro's donation.

In 1997 started a project in order to make an inventory of the Simarro's legacy. It was a very laborious work because of the limited technological resources. The count was finished in 2003 but at this time many other projects of Unidad Técnica de Cultura of Complutense University were opened. This fact caused that Simarro's Legacy comparison could not be finished completely.

During 2011, university staff made an exhaustive comparison and check of the information about the previously held material and some outstanding mistakes were discovered:

- Misprints in the last comparison without inventory number;
- Location changes;
- Works in unknown place.

After observing those problems, resolution phase was started:

- To correct and to update the check of the Legacy by defining and relating the inventory numbers, work and title.
- To update the new locations.
- To investigate the places of the unfounded works: other locations, in conservation departments, in exhibitions.

The check should be done work by work, trying to confirm and comparing its location and number of inventory.

Simarro's legacy comprises more than one thousand pieces, many of them with a high artistic value and they are very requested for temporary exhibitions outside Complutense University. The most demanded pieces are Sorolla's and Sala Francés paintings. Scientific tools and histological preparation slides are also very demanded because Simarro was working for scientific shows.

If the Unidad Técnica de Cultura wants to lend the works for temporary exhibitions it is necessary to have an updated information about conservation status, location and availability. Simarro's Legacy is extraordinarily extensive and it should be checked annually at least.

Conservation proposals and recommendations of Simarro's legacy

Simarro's legacy comprises 1,200 pieces that are preserved in the Library of Psychology Faculty. All of them are graphic documents but also we find a great deal of supports made of cellulose. In this collection are conserved photographs, watercolors, ink, ballpoint pen, pencil and charcoal – lots of different techniques that suffer different ageing.

In addition, not all works have been preserved in the same way: some of them are restored and framed and others are placed in mat boards. Finally, we can find pieces that have not any reinforcement.

However, the most valuable and important works (about 30) are kept in directors offices because the university does not have a suitable museum to hold them. For example, some drawings made by Sorolla participate in temporary exhibitions all around Spain and they are subjected to many movements.

Conservation status is good despite of having storage areas that are necessary to improve and some works should not participate so often in exhibitions.



Fig. 2 - Drawings are accumulated in folders inside the drawing file cabinet.

Diagnosis

Works of art that are kept in offices are subjected to fluctuations in temperature and relative humidity as well as constant lighting changes. However, despite this alarming situation, most of them are in good conditions and only few paintings had knocks or the canvas is loose due to lack of maintenance and care.

Drawings, sketches, engravings, watercolors that are stored in the Library of Psychology Faculty have alterations such as oxidation of the cellulose support, *lepisma saccharina* attack, inks erosion, impurities, tears, stains, oil and grease, all of them caused by improper handling.

Proposals for conservation

The management of university collections strongly depends on the general budget. So the choice between spreading and conserving the works is not clear. Nowadays the legacy has a wide exhibition activity in Spain, but the action of spreading implies risks during transportation and exhibition.

Most of Simarro's drawings (about 1,200 works) are preserved in the library of Psychology Faculty without conservation control. We created a conservation project not exceptionally novel or innovative but it was so simple and effective because it fitted with limited budget and storage conditions that artworks needed.

1. Works stored in the library of Psychology Faculty

Some of the works are framed and in other cases they are simply protected with acid free tissue that is too small.

In other cases, some works are introduced in conservation folders that are deformed by weight.

It is proposed to maintain the drawing file cabinet following the division into folders that Simarro did. To prevent slippage of the folders on the surface of the drawing file cabinet is recommended to make Plastazote⁴ barriers (TACON 2008a).

We propose a division of the legacy in five groups depending on technique and packaging of works:

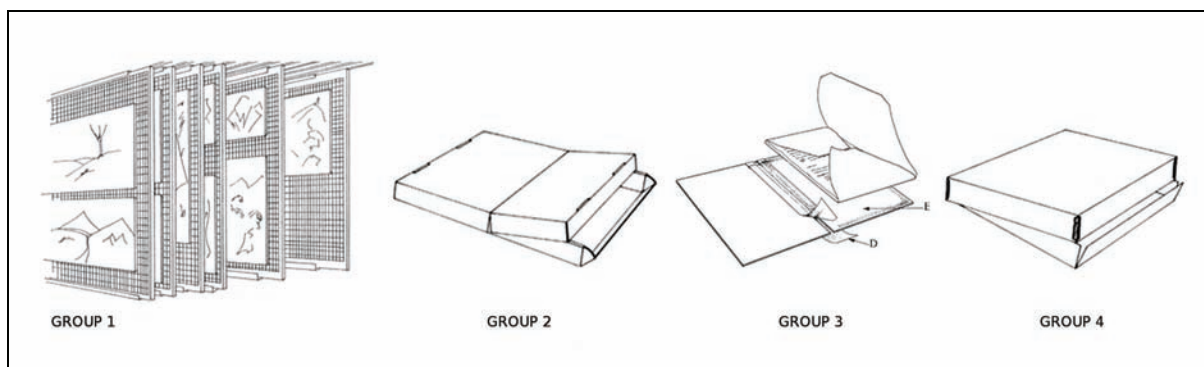


Fig. 3 - Group 1 (sliding screen), Group 2 (conservation boxes), Group 3 (conservation folders), Group 4 (photographs conservation boxes) © Government of Canada, 1993–1996

Group 1: Framed works

It would be advisable to place these pieces in a vertical position on the wall, for example, using a sliding screen.

Sliding screens are a very common storage method for paintings. Paintings can be suspended from the screens by appropriate hooks or other hardware. Such systems use floor space economically, and are efficient for examination and retrieval purposes (VERGARA 2002).

Screens are made of perforated metal or rigid wire mesh supported on a metal or wooden frame. Each screen is attached to an independent overhead and floor track that allows it to be pulled out, thus giving easy access to the paintings. Installing extra guides on the upper track will minimize swaying

⁴ Plastazote foam is a closed cell cross-linked polyethylene foam available in a wide range of polymer combinations. These combinations allow the material to exhibit different characteristics such as increased rigidity, improved temperature resistance and improved moulding ability. Lightweight, tough, flexible, moisture resistant, C.F.C. & H.C.F.C. free, that is easily fabricated, chemically inert and resistant to oils, solvents, dilute acids, UV light etc. Plastazote is available in a wide range of colours and used in many applications.

and jarring. The suspended racks can be operated easily, and the screens can be slowed and stopped manually. Two people are normally required to remove paintings from the rack (CCI 1995).

Group 2: Graphic document stored in folders

It is important to place these pieces in a horizontal position inside the drawing file cabinet and protect them with lining free unbuffered Japanese paper⁵. After this, we propose to introduce/get in works in archival boxes made of corrugated mat board⁶ with 6mm thickness (TACÓN 2008b).

All boxes would be identified with acid-free laser labels for file folders (Perma Seal labels⁷) and permanent pen (Pigma Micron Pen⁸), the best way to prevent reagents that could damage adjacent documents.

Group 3: Graphic documents mounted in mat board

It would be advisable placing these documents in a horizontal position inside the drawing file cabinet and protect them with unbuffered Japanese paper and long-fibred and mounted in conservation boards (ROTAECHE 2008). To prevent the interleaving sheets from moving, it is necessary to fit them inside the storage container. Place one sheet between each work.

Group 4: Photographs stored in folders

It is important to place these documents in an horizontal position inside the drawing file cabinet. Due to the different paper sizes we propose to envelop them in Silversafe Photostore⁹ and store them in archival boxes (MACCLEARLY & CRESPO 1997).

Group 5: Original folders of Simarro

It is recommended these be wrapped with long-fibred unbuffered Japanese paper and stored in individual cases with Polyfelt¹⁰ and a cotton tape.

2. Works kept in offices

Works of art that are hanging in offices should be repositioned in relation to accidental damage from knocking (CCI 1993):

- Avoid hanging close to shelves, furniture or where people can knock it.
- Avoid hanging behind doors, or in busy corridors where the painting may easily be damaged.
- Works should rest face out against a clear wall on a padded surface.

⁵ High quality paper, acid-free, handmade in Japan according to ancient processes, with natural fibres such as Gampi, Kozu, Mitsumata.

⁶ Corrugated mate board is made from 100% rag or lignin-free cellulose. Sometimes those labelled as 'museum board' or 'conservation board' are not of the highest quality. Alkaline buffered boards are not sufficient if the board contains wood pulp.

⁷ PEL Perma/Seal and Perma/Seal foil back laser labels provide archivists, conservators, curators and other collection care specialists with a variety of acid free label formats for their laser printers. All feature a non-yellowing, pressure sensitive acrylic adhesive. The foil back version provides an extra barrier between the acid-free paper and the adhesive to prevent bleed through and to enhance the ability of the label to adhere to rounded or other irregularly shaped items.

⁸ Pigma Micron pens are acid-free and archival, making them ideal for paper crafts, journals, illustration, crafts, or any application requiring precision and permanence. Unlike dye-based ink found in most pens and markers, Pigma ink will not feather or bleed, even through the thinnest paper. Pigma ink is derived from a single pigment to ensure color consistency, and is fade proof against sunlight or UV light. Pigma inks will not clog or dry out like most mechanical pens.

⁹ This paper is free from chlorines, sulphates and any other chemicals that could damage photographic materials. The paper is unbuffered, and smooth to prevent scratching, this paper is sized with a neutral curing dimer and passes the A.N.S.I. photographic test (PAT). Used for the storage of photographic materials and in the construction of envelopes, folders and interleaving. Also used for the storage of silver artifacts textiles particularly silk and wool where the presence of an alkaline buffer could be detrimental.

¹⁰ Polyfelt® is non woven geotextile, which made from continuous filament of 100% UV stabilized polypropylene with bonding by needle punched (mechanically bonded). They are characterized by a high resistance to installation damage, high water permeability and increased UV resistance.

Storage environment

To retard the deterioration of artworks, it is important to control temperature, relative humidity, and light (CCI 1995):

- Do not store or display works of art in areas of potentially high humidity or water leakage.
- Relative humidity (RH) over 60% accelerates chemical and biological deterioration. It also promotes the distortion of paper. Therefore, the recommended RH level for general paper collections is below 50%.
- Avoid areas where temperature and humidity fluctuate, or where there is poor air circulation.
- A low temperature in the storage area slows the rate of deterioration of paper and increases the lifespan of paper. However, where human comfort and cost are a consideration, the maximum acceptable temperature is 21^o C.
- Do not hang artworks over or under radiators, heating and cooling vents, active fireplaces, humidifiers, and vaporizers.
- Try to avoid direct and excessive daylight (light damage is cumulative and irreversible). Exposure to both natural and artificial light can cause photochemical deterioration of paper and of images on paper. This may result in pigments and dyes fading, and in the paper substrate discoloring. Filter out damaging ultraviolet rays present in sunlight and in fluorescent lights. Turn off lights in storage areas when the areas are not in use. In areas where paper artifacts are exposed to light, the ultraviolet component should not exceed 75 microwatts/lumen. Block light from windows with blinds or drapes. If windows cannot be blocked, use ultraviolet filtering material.
- Whether in storage or on display, it is necessary to reduce the amount of light and to restrict the exposure time for paper artifacts. The recommended level of illumination for sensitive materials, such as watercolors, colored prints, and works on poor-quality paper, is 50 lux or as low as possible. A maximum level of 150 lux is recommended for works without light-sensitive materials, such as stable carbon inks on good-quality paper.

Conclusions

Thanks to private donations like Simarro's legacy the heritage of a public university is enriched and it allows the public to know about university museums and collections. However, Unidad Tecnica de Cultura and Complutense University of Madrid should take some simple steps to promote circulation and preservation:

- It should take down the artworks from offices and departments and make easier their exhibitions in places fit for purpose.
- It is necessary to guarantee a good conservation statement of the most valuable works.
- If the university wants to make a widespread coverage about its works of art it should take care of them. For example, trying to get a good storage environment and to avoid direct and excessive daylight.
- It would be valuable that Unidad Tecnica de Cultura and university staff be in contact giving a report, for example, detailing works of art location changes or accidents.
- It is important to educate university staff showing them how to put into practice some conservation guidelines.
- Unidad Tecnica de Cultura should encourage staff technical knowledge and to assign skilled and specialized personnel to specific tasks.
- It would be very interesting if university government is aware of the great and valuable heritage that Unidad Tecnica de Cultura and other university staff take care. Therefore, the budget may be increased and a better maintenance of the art works could be possible.

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The Polo Museale of Sapienza University of Rome: an opportunity for culture, education and tourism

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Abstract

Over the years museums used new technologies to catalogue their collections both for internal management and to make them available to citizens, scholars and tourists. New technologies meet their needs by disseminating knowledge about cultural heritage.

The “Polo Museale” of Sapienza University of Rome, encompassing 20 museums, aims to promote cultural heritage and knowledge dissemination as well as develop a museums network for sharing information and experiences. In this paper, we discuss new frontiers of communication and new perspectives on museum visits. In particular, we present a Polo Museale project aimed at connecting its 20 museums for increased openness to society and integrated public service.

Introduction

Computer science applied to cultural heritage has become an important instrument for management, analysis, study, research and dissemination of heritage. Different applications represent innovative ways to use technologies and communication reshaping new roles for museums in education, study and leisure.

Museums, particularly university museums, were created as educational and research institutions. In recent years, they have developed programs for increasing access to their information from citizen through diverse communication channels and different languages, adapted to the learning and leisure preferences and expectations of individuals and communities. Many ongoing projects aim to create itineraries and laboratories to encourage, advice and stimulate the youth and seniors and tourists to visit museums.

In this paper we discuss new frontiers of communication and new perspectives of museum visits. In particular we present and discuss a project at the *Polo Museale of Sapienza University* of Rome for connecting its 20 museums and increase their access to society, especially to school groups. We will focus on to tools for the dissemination and promotion of cultural heritage for children as well as new research about adult learning and the accessibility to cultural heritage from tourists and particular communities such as disabled users.

Museum role

Traditionally university museums concerns research and university didactic role but the cultural dissemination and education for university and school students and for citizens has more recently become a general cultural concern too (FALK 2000).

Different experimental learning theories were applied to build a system to develop the students' activity, such as for instance the Kolb theory (KOLB 1984). By applying such theories to museum objects (MARIE 2010), the potentialities of learning from university museums and collections in higher education is pointed out (DHUS 2009). Moreover, tourism is also changing with increasingly short-term stays and interest concentrated on cities and cultural locations. In order to provide new visit opportunities, many museums are reviewing their cultural offer and content as well as tailoring communication types and channels to different users.

The didactic online can be an useful instrument to engage teachers and students to visit museums as we can see on the website of Museo Galileo in Florence, Italy, with the *Science in Play* which is an

educational game which offers a first approach to science and to Galileo Galilei. The game is adapted to all ages, but is especially designed for the young and school groups.¹

Database for cataloguing and information systems, also through web, have been recently developed for the needs of different subjects who work in the cultural heritage field. For many years the museums have developed online catalogues, but there are critical issues for this way. In fact, often, the information of museum heritage have been written with scientific and high level language, so not available to the general public or school teachers and students. To solve this problem while new technologies of digitalization and 'access' can give opportunities to re-think the ways by which institutions represent, classify and describe their contents. By providing different access to information and services according to the user's profile, personalization helps to respond to museums educational and curiosity needs.

Studies on visitors seem to confirm that learning is stimulated when the information is described in terms that the visitor can understand and is referred to their interests of visitors as well as concepts the visitor already encountered during the navigation/visit. Personalization is therefore a new communication strategy based on a continuous process of collaboration, learning and adaptation between museum and visitors.

A first important distinction concerning the amount of control the user has on the personalization process can be made between customization and personalization (BOWEN 2005).

There are different ways to use these methods of communication: to create a personal way to access to museum information from different types of user or themes.

The system gives information related to particular profiles or thematic²; another approach is to create a customized web gallery selecting images from digitized collections, accompanied by personal comments or descriptions.³

The Polo Museale Project

Sapienza University of Rome has a rich scientific and cultural heritage preserved in 20 museums. For promoting and enhancing the value of these museums, Sapienza University has created in 2010 the *Polo Museale (PMS)*, the system of museums as a center for coordinating activities. In Sapienza one can find museums relating to different disciplines as botanical science with the botanic garden and herbarium, archaeological science, with the Classical Art Museum which collects plaster casts of Greek statues; the Etruscan Italic Antiquities Museum; the Near East Museum and the Origin Museum. These museums have collections from excavations in different locations inside and outside of Italy. The Physics and Chemistry Museums house scientific instruments collections. Another important scientific field is earth science, which is represented by geology, mineralogy and paleontology museums. In the anthropology, comparative anatomy and zoology museums, we can see objects relating to natural history of homo sapiens and other primates, a collection of skeletons from large vertebrates and insects collections from all over the world. Historical medical exhibits, that help visitors trace the development in medical knowledge, are available in the museums of history of medicine and pathological anatomy. There are also other particular museums as hydraulics, mineral deposits, laboratory of contemporary art and commodity.

Most museums are open to the public, many primary and secondary school classes visit them every year and tourist groups became to organize visits to Sapienza museums.

¹ www.museogalileo.it/en/explore/online/didactic/scienceplay.html (accessed May 19, 2012).

² www.louvre.fr/llv/enseignants/enseignants.jsp?bmLocale=en (accessed May 19, 2012).

³ www.europeana.com/portal/ (accessed May 19, 2012).

PMS aims to provide public more opportunities and occasions of access to its heritage for becoming meeting point for teachers, students and citizens.

Different projects are ongoing, using multimedia and network technologies, to promote scientific culture for a wide public.

PMS has rethought its website, which now allows to access information on: PMS organization, multilanguage section to promote museums in the culture international context, useful information of each museum, by different users.⁴

Different initiatives are being tried to help young people increase their knowledge through the use of museum objects. Experiments, games, videos and the like installed in museums help to reveal knowledge related to museum objects in easily understood terms. Particularly illustrative of the initiatives are the movies of the *Night of the Museums*.⁵

Another project regards the opportunity to reshape the ways to communicate and describe museum contents. Didactic laboratories in museums and via web have been built for encourage children to learn by museum objects as experimental activity of *DNA extraction from banana* in Chemistry Museum.⁶ It is becoming more important to increase museum visits from schools and tourists so it is important to increase the ways to present didactic itineraries to students and to make multimedia for the public. For example, the Chemistry Museum of Sapienza has made a video of school visit and put it on its website.⁷

Polo Museale with primary school Anna Magnani started in 2011 a project for using museums objects as learning instruments for children. The project aim was to redefine the relationship between school and museum. The museum is a privileged means of education, a real learning environment where children can go at the end of education program started and developed in class. The people, the events of the past, tools, discoveries become concrete through museum collections and objects. The student, through thematic itineraries and the guided visit, is actively engaged in the discovery of ancient history, science, art and technology in a context certainly more appealing than the classroom. The teacher during museum visit has a vantage point of its students, will validate the development in cognitive, emotional and identity. The child at the museum will have to respect rules and relate to others properly (area identity), will gather information, prepare any questions to the expert, selecting more interesting museum objects (cognitive area). PMS project aims to put museum information in the classroom as learning content. Multimedia technologies and products with the ability to integrate different type of content can help to overcome a teaching based on the transmission / reception of content that is often fragmentary and superficial in support of creating exciting learning environment. The museum object can be analyzed by several points of view: in different contexts such as related discipline, historical period, material, as a relation with other disciplines or experiments. In addition, the museum object can be used as image related to concept within a lesson. In this case, the visit to the museum, after classroom lesson, can enhance student level learning through 'experience' of object (PARIS 2002).

Personalized itineraries via web and hypertext tools were developed according to a new communication strategy based on a continuous process of collaboration, learning and adaptation between museums and visitors (WANG 2007). Teachers can connect to objects in the museum catalogue and choose the right objects for explaining a discipline in their classes. Currently the system allows this for the Chemistry Museum. Teachers can search museum objects useful for their teaching

⁴ www.musei.uniroma1.it (accessed May 19, 2012).

⁵ www.musei.uniroma1.it/notteen10.asp (accessed May 19, 2012).

⁶ www.youtube.com/watch?v=3Ta7jmE0Ayc (accessed May 19, 2012).

⁷ www.musei.uniroma1.it/sitistage/museodichimica/VisitaDidattica.html (accessed May 19, 2012).

and can download information and images into their computer to build a hypertext lesson. This tool has been integrated with another one developed by Sapienza University, ASD (Accessible Site Developer), which allows to build automatically a hypertext from contents, accessible via web. To manage contents, ASD is based on a couple of technologies: Java and XML. Web pages are in XHTML language. ASD does not require any particular hardware and software, it's a portable system.⁸ The user can choose a customized itinerary downloaded previously in the editor of ASD tool and he can put the images and information related to the content of the lesson, so that the teachers will be able to explain the lesson with museum objects images and information. Following the teachers can take the students to the museum where they will find the objects previously observed in the context lesson. The students can build up reports by associating theoretical knowledge with museum objects, after visiting the museum (fig. 1). Results and hypertext made by teachers are available via website project.⁹

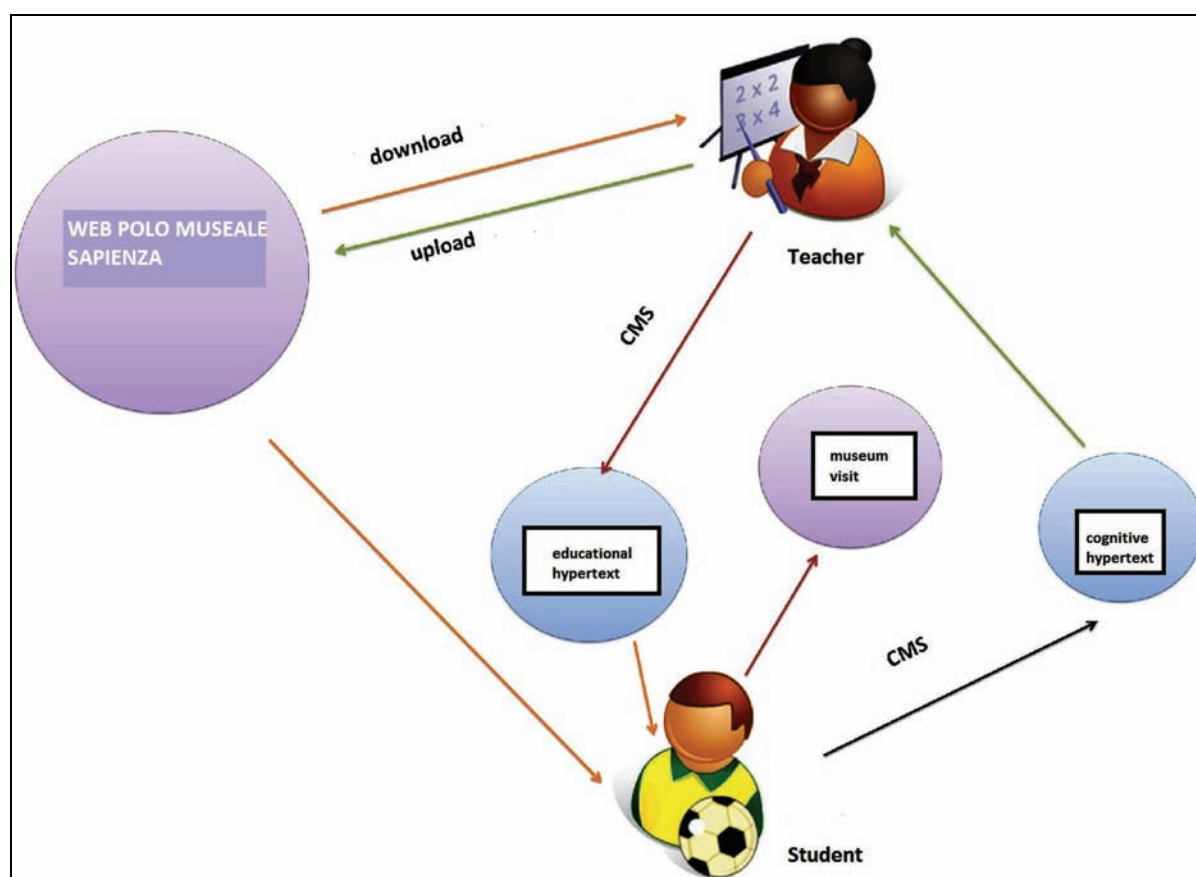


Fig. 1 - Scheme Project *Museums and School*

New perspectives

For improving access to museum by school and cultural tourism it is needed to rethink the offer of the contents, to use web or new instruments communications, to make multimedia materials and build museums network and integration to school and tourist networks. Only some of the 20 museums of Polo Museale Sapienza have their heritage online. The next step of project will be to put online all objects in all museums with the Europeana project.

⁸ w3.uniroma1.it/ciabc/asdeng.html (accessed May 19, 2012).

⁹ www.musei.uniroma1.it/progettomiur/index.html (accessed May 19, 2012).

Personalized itineraries via web will be developed to access to all museum objects related to particular user profiles (citizen, tourist group, school) as well as thematic links between museum disciplines.

Today most museums have an online presence and are planning to experiment with the forms of interactivity that we characterize as 'Web 2.0' interactions. The push for experimentation comes from museum staff as well as museum visitors who "no longer accept being solely consumers of information" but want to contribute their own experiences and interpretations. The new arrangements for Web 2.0 allow different users to collaboratively enrich content by using web tools.¹⁰

It aims create a collaborative platform to include information of museum objects from teachers as well as scientific information. Technologies can help disabled people to access museum information. While the application of international standards can provide accessible web museums by visual impairments because the screen reader tool translates from textual information to audio, for the deaf people it is necessary to rethink the language used to explain museum contents. Better to use the sign language which can be recorded on video and made available on digital support or via web. The British Museum, an example, asked three groups of Frank Barnes' students to use BSL to describe some of the key objects in the museum.¹¹ PMS aims to connect to deaf association to build virtual itineraries making video in sign language.

Conclusion

The new technologies and the new communication channel can help museums to increase cultural dissemination and visit of public. For many years museums have developed programs to rethink their contents and communicate within and out of their location. New lines of research look at the development of technologies and their application open new frontiers in this field. Building museum networks, in particular of university museums, can become useful tools for sharing content and also the experience to improve their position in the realization of the knowledge society. In this context PMS has an aim to reshape promotion and communication of its cultural heritage.

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¹⁰ commons.wikimedia.org/wiki/Commons:WikiProject_Museums; www.museogalileo.it/partecipa/progettawiki.html (accessed May 19, 2012).

¹¹ www.britishmuseum.org/learning/schools_and_teachers/school_projects/bsl_project.aspx#African_Masks (accessed May 19, 2012).

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Taking care of identity, memories and heritages: Experiences at the Museum of the Federal University of Alfenas, Minas Gerais, Brazil

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Abstract

This paper presents the project “Planning Unifal’s museum: the student’s relationship with Unifal’s heritage and memory” that is being developed since 2008 in order to guide the students of the university and stimulate the external community to participate in the basic steps of creating a museum: developing internal policies, organizing, cleaning, storing the collections, planning and setting up exhibits, among other activities. As one of the project’s outcome, we shall present an exhibit that addresses important issues about museums and heritage, emphasizing the role of museums in shaping the concepts of museum and heritage.

Introduction

Since the end of the twentieth century, Alfenas Federal University¹ has come up with the idea of creating a museum focused on celebrating its own memory and heritage. Through the resolution #018/2007 of the Superior Council, the university established the museum, the so-called Unifal’s museum. After hiring a museum expert, the idea started to become real: taking the first steps to the Museum of Memory and Heritage of Alfenas Federal University (MMP – Unifal – Minas Gerais) and conceding a space – a building that had been used by the university since the 1940s.

The museum is still under its development phase. Yet, it is aided by Unifal’s internal and external community in the planning of basic steps in creating a museum: developing internal policies, organizing, cleaning, and storing the collection; preparing and setting up exhibits, among other activities, through the participation in a specific goal. The project *Planning Unifal’s museum: the student’s relationship with Unifal’s heritage and memory* is being developed since 2008 and has reached its objectives in managing and coordinating the above mentioned activities.

Thus, the present paper focus on discussing this project – how it has been conceived, organized and developed – presenting its results. Yet, among its results, we highlight the exhibition *About many things: The importance of the museum and Unifal’s heritage preservation*.

About the project “Planning Unifal’s Museum: The student’s relationship with Unifal’s heritage and memory”

The main goal in creating this project is organizing, making feasible, and defining the activities that would be chosen and developed by the professors, students and the external community of Alfenas Federal University interested in joining the process of creating the museum. According to what we mentioned, this university decided to implant a museum specifically for its memory as an institution, but with limited human and financial resources. Therefore, the volunteers participation is fundamental and serves to make up for the difficulties caused by this limitation, but also to allow the community – academic and external – to experience a different activity: the participation in a museum’s creation.

The activities, since 2008, are inclined in the following trends: 1) Organization and planning; 2) Collections cleaning and research; 3) Developing and executing exhibits. Such activities, and its benefits for the participants are:

¹ Abbreviation Unifal-MG, known by the locals as Unifal.

1. Organization and planning: Reading, analyzing and discussing matters related to museums and museology; preparing the advertising of the museum and its activities; developing projects to acquire funds to restore the building and some of the objects on collections; and organizing the annual events. In taking part in the museum's management, the participant will learn basic principles of planning projects and other steps in the creation of an institution, and also contribute to a healthy cultural relationship in the society, that will bring the benefit of being a conscious professional and also a citizen responsible for the heritage's preservation for the future generations.

2. Collections cleaning and research: Cleaning the selected objects; registration, basic documentation; reading articles about preservation and documentation; researching basic information about the objects (origin, date, usage, manufacturing, and history). In this activity, the participants will develop their interest in the university's heritage and memory, as well as work straight with the history of the university's faculties from the relationship with the objects – most of them considered no longer useful according to their original scientific purpose – but still very important to the science history and progress. The participants, after a previous selection, will research the chosen objects, about its origin, usage, provenance, and other aspects. This research will be useful as a documentation method of the Museum of Memory and Heritage. However for the students it might become a study object for a deeper future research, or as a final graduation project.

3. Developing and executing exhibits: Developing the project means drawing the objectives, chronogram, goals, needed resources, defining the staff and its respective tasks; shaping the target audience; planning the space and the objects arrangement, considering the safety of the objects and the audience; and reading articles about this subject. About setting up exhibits: acquiring the necessary material, executing the project itself according to the needs that were brought up at the project's conclusion. In this working group, the participants have the opportunity to improve the methodology necessary for a project/research development that is intended to be presented to an audience: developing the exhibition's project considering objectives, justification, feasibilities, problems, expenses, among other topics. Also, executing the exhibit – thinking of an arrangement of the objects in a communicative approach that comprises an introduction, development and conclusion – moreover, reflecting about the matters that would awake the audience's interest effectively.

There are many cultural profits for the Museum of Memory and Heritage, for Alfenas as well as for its surroundings. Most importantly, we are able to allow the audience to experience a relationship with Unifal's memory and heritage through the exhibitions; make the collections' information and knowledge known in order to bring an accessible collection to the society, through a research accomplished by the participants; the creation of a support center for all museums and cultural centers in the south of Minas Gerais, aiming to preserve and communicate its memories and its heritage. We also intend, as a possible result in the long run, to allow the volunteer students from different places to perceive museums as places for a rich experience for experts of many different fields, considering the diversity of museums: science and technology museums, history museums, virtual museums (for instance, information technology professionals), pharmacy museums, dentistry museums, community museums (e.g. professionals from human and social sciences), museums related to the geodiversity – all of them requiring professionals and experts of various fields.

We want all the people concerned during the project's execution (directly or indirectly) to perceive that heritage, memory and museum are not only resources to identity's strengthening and self-discovery, but also to each other – one to another – building strong bonds. The Museum of Memory and Heritage is a museum that intends to celebrate the memory of an important Brazilian educational and scientific institution and its faculties – from those founded in the beginning of the twentieth century up to those created recently. Thus, we want the Museum of Memory and Heritage to allow, according to its project

development and execution, this relationship between its achievers and its audience with the identities, experiences and memories – that is nothing but the museum as a phenomenon. Based on these premises, we ensure the relevance of this project that aims, with the collections, the awakening of the audience's interest: first, the university's students and professors as well as the external community (Alfenas and its surroundings) to the documentation of Unifal's history and memory.

Therefore, we present in the next section the accomplished outcome at the execution of this project and, as a case study (that also results from the development of this project), the first exhibition of Unifal's Museum of Memory and Heritage.

Results and case study – the exhibit *About many things: The importance of the museum and Unifal's heritage*

With the participation of the students and the external community during the four years of execution, we developed the following activities according to the mentioned topics:

1. Organizing and planning: Execution and assistance in creating a museum's guiding plan; making the advertising of the museum and its activities; planning an Internal bylaw and the collections; developing projects to acquire funds from federal institutions such as Petrobrás, BNDES, Rouanet Law (a Brazilian law that supports cultural institutions) and organizing annual events such as the National Museums Week, the Museums Spring (both events had their fourth edition this year at Unifal) and the National Week of Science and Technology.
2. Cleaning and Researching the collection: Documenting scientific instruments: 590 objects from the pharmacy faculty, 56 objects from the dentistry faculty, and 105 objects of general use; creating 200 documentation files with photographs; cleaning and storing part of these instruments.
3. Developing and executing exhibits: With the collection of Unifal's museum, were developed the following exhibitions: *About many things: The importance of the museum and Unifal's heritage preservation*, *Moments, memories and experiences: Efoa/Unifal 95th anniversary* (photographs), and *The right measure: The importance of scales in our daily lives*; some others with external collections: *Feminine expression: Glances over Southern Minas Gerais* and *Feminine expression: Spring, museums, women and memory*, both developed from paintings of women from all over the southern region of Minas Gerais state. And also travelling exhibits: *Brazil: Our history* (from the Brazilian National Historical Museum), and *Leonardo Da Vinci: Mechanical wonders* (from the Museum of Astronomy and Related Sciences).

As a case study, we highlight and discuss the first exhibition *About many things: The importance of the museum and Unifal's heritage preservation* – how it was planned, executed and its results. During the planning, we understood that it was necessary to discuss the concepts of museum and heritage – as these concepts belong to our journey between past, present and future. Therefore, this exhibition aimed to: work in a critical and educational way on issues concerning museums and heritage; point out the importance of preserving Unifal's memory and heritage through some objects of the Museum of Memory and Heritage; and set a relationship between Unifal's memory and heritage and the students, professors, employees and visitors. Our proposal did not mean to present complete answers but to bring questions; as well as we did not mean our audience to visit only once, but to come back other times.

The exhibition occupied an 82m² room split in seven different modules, and it was opened to the audience from April 2009 up to February 2010. When entering, the visitor faced a frame with the questions: "What is a museum?" and "What is Heritage?". Both questions had three possible answers, and the visitor had to choose the one that seemed to be the most appropriated. The question "What is

a museum?" had the options: 1) Place to store old things; 2) Institution – or 'a knowledge temple' – for valuable things, paintings, and other objects of great historical, cultural and artistic value ; and 3) A phenomenon that has been happening since humanity exists – a relationship between any human being and the reality, crossing memory and identity.

The question "What is heritage?" had the options: 1) Inheritance left by our ancestors and/or goods acquired through a lifetime; 2) Tangible goods that have great meaningful value for a society, being esthetic, artistic, documental, scientific, social, spiritual, or environmental; 3) Communicative resource that is able to tell continuously the relationships between humans and its worlds.²

The next information shown in the exhibit was related to the concepts of heritage and museum, emphasizing the development of its concepts and its manifestations in Brazil. A brief history of these concepts were also shown, as well as two different definitions of each concept:

Heritage – The act of preserving a historical place and certain objects in order to keep the esthetic and symbolic models. Preserving it means witnessing the essence of a glorious past that survives through changes.³

Museum – Nowadays ICOM defines museum as

"a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment" (MAIRESSE 2005, 16–17).

Relating to the concept of museum, it is relevant to mention that we also displayed the importance of the International Council of Museums (ICOM) to the world.

After that, we invited the visitors to rethink the exposed concepts, based on the idea that humanity dedicated its entire experience to ponder its endurance on earth. Then we brought the following questions to the visitors: To whom should we preserve something? To humanity? We pointed out, as a possibility, that heritage can be a communicative resource of the history of those it relates to. We also presented the concept of museum as a phenomenon, taking its complete shape, existing in all places and all times. What is nullified is the existence of an 'ideal' museum: "the museum takes its possible shape in every society, under the influence of their values and representations" (SCHEINER 1999, 139–140). Seeing through this perspective, we bring again another question: "maybe the origin of the Museum would be the human body, where memory lives, and from which it is originated all the evolution of the Museum and its processes mediated through reason and emotion?" (SCHEINER 1999, 137–138).

Thus, concluding this part of the discussion, we displayed a frame with photographs of Unifal's different moments: events, ceremonies, classrooms, laboratories and also informal events – highlighting the importance of these moments to the university's memory.

On the other hand, we presented an exhibit of scientific instruments that belong to the collection, most of them pharmacy and dentistry objects from Unifal's first faculties. Instead of displaying the information with subtitles, we displayed it as a documentation file, in order to make the audience familiar with the museum's methods and internal work. Among the objects we also included information such as: the difference between conservation and restoration; how to create a museum as an institution; the importance of documentation through the lack of information in some objects; the importance of the exhibits; the different types of museums.

² Based on SCHEINER 2004.

³ Based on SCHEINER 2004.

At the end of the exhibit, we displayed the following information:

"If the idea of Museum and Heritage can be built from the way we cope with our reality; from our references, sources, memories and identities. So, what do Museum and Heritage mean for you? You are free to represent it: through comments, poems, drawings, etc – use your imagination!"

Then the visitors could express their thoughts and impressions on two frames.

How did the audience 'react' to the exhibition? At the beginning of the exhibit, on the board with the question "What is a museum?": 9% of the visitors answered "A place to store old things"; 81% answered "Institution – or 'a knowledge temple' – where valuable things, paintings, and other objects of great historical, cultural and artistic value"; and 10% answered "A phenomenon that has been happening since humanity exists – a relationship between any human being and the reality, crossing memory and identity".

On the frame with the question "What is Heritage?", 45% of the visitors answered: "Inheritance left by our ancestors and/or goods acquired through a lifetime"; 46% answered: "Tangible goods that have great meaningful value for a society, being esthetic, artistic, documental, scientific, social, spiritual, or environmental"; and 9% of the visitors answered: "Communicative resource that is able to tell continuously the relationships between humans and its worlds".

The last frame, where people could express freely their impressions of museum and heritage, we noticed that most visitors were students from the university and also from other schools (private and public). During the visit, we always asked, after explaining the power of heritage, what this concept meant for the group. Many children related it to their religious beliefs. When we asked about museum, they associated it to family photographs, albums, objects that were inherited from generation to generation. As an example, we mention here the comment of a ten year old visitor, Ana Flávia da Silva:

"Me, Ana Flávia da Silva, loved knowing this museum. I hope I'll have more opportunities to know this cool place. I hope that you guys will maintain this place so special and who knows within twenty years I hope I will bring my children here. Maintaining this place is everyone's duty, because this place is not only a museum but a place where people can express himself."

Conclusion

According to what we mentioned above, this exhibit stimulated us to continue the work, investigating and researching the concepts of museum and heritage of the academic community and Alfenas' people. We want to study concepts of museum, memory, heritage, focusing on heritage education. We propose this work in the following way: 1) Applying forms with questions in order to find more about the social imaginary that surrounds these concepts; 2) Presenting workshops about these topics, exposing contemporary discussions; and 3) Presenting workshops in Alfenas schools in a more appropriated language for the young audience. However, our objective is, that our proposal be considered and built along with the participants, using the topics we mentioned above, but also opened to other trends.

This activity will take place simultaneously with the first actions we have been developing since the beginning, because they are a crucial step into the Museum of Memory and Heritage's creation. The exhibit we referred to above, only stirred up the need to work on the concepts of museum and heritage and how they were (re)built throughout time, up to the creation of the Museum of Memory and Heritage and its local relevance, establishing bridges and keeping dialogues about concepts that are not brought to the audience in most museums.

We defend museum not only as an institution, but also as a phenomenon related to the various ways of representation of the reality (SCHEINER 2001, 17). Acknowledging museum as a phenomenon, allows it to be perceived through the life experience of each individual, according to the diversity of multiple and complex relationships that each human being or society sets with reality. Relating to museum: the emotional connections happen more frequently caused by identity perceptions relied on the memory, that can be individual or collective. Representations of identity have essentially an emotional character, filled with the symbolic aspect of the individual memory and that acquire other meanings through the boundaries of the social imaginary, the creation, and the emotion.

Gorgas (2008) defines museum as a permanent construction along with the social dynamics, as an agent of power and cultural dynamics. She points out the difficulties and responsibilities that the Museum has when building its own concept to its audience/community. Soares (in print) claims that the Museum manifests itself in the community through its relationship with the Real, “preserving the memory, the values, and the experiences in a democratic and whole way”. Through this process the community becomes the Museum itself:

“considering museum as a phenomenon means seeing it in constant movement, a steady process of self-renovation, for this is how a phenomenon behaves. This is a process that follows the transformation of the individual (or community), because the museum relates straight to them. [...] The phenomenon, a totality of the appearance, is the change itself, or it has the change as its essence, and it ends up working almost as a mirror in which the one perceiving and the one perceived are seen reflected one in the other, within the supersensible world (SOARES [in print]).

It is in the contemporary changing world, that different types of manifestation of the museum as a phenomenon take place. It is in this post-modern world that we understand museum not only as spaces where ancient objects are found, but spaces of non-formal learning; spaces of experimentations, places for research and knowledge; where debates, cycles, experiences and other relationships with different audiences take place.

For this relationship to happen in a whole way, it is necessary the participation of the society/community in planning the museums discourse and dialogue, because no “intellectual approach could substitute this view over the community life, only possible when the community speaks up and represents itself as a social fact, with a multiple character” (SCHEINER 2004, 161– 162). Thus, museums need to consider its own journey and all the controversies here discussed (relating to the concepts of museum and heritage) when dialoguing with the audience. When exposing itself to the audience, it is not enough to inform on the collections and the knowledge field that are being displayed, but also informing its own history as a part of a greater phenomenon; which concept of museum is considered as the guide of its discourse; and what the museum defines and understands as memory and heritage. We propose that the Museum of Memory and Heritage allow this relationship among its achievers and audience with their identity, experiences and memories – that is nothing but the nature of the museum as a phenomenon.

It is relevant to mention here the difficulties faced during the project's execution: we still have a very small number of students who are also participants according to the number of Alfenas Federal University students; the number of professors who are active in the memory and heritage field is almost zero; and budgetary problems, as the resources provided by the university are not enough, and our projects for fund acquisition have not yet been approved.

Museums must consider the questions and demands of the contemporary world to lead its acts: without dialogues, discussions and participation from those who are interested in preserving the heritage comprised by the collections, it is not possible to have a fair museum action. This project

essentially come to build bridges; connections between the Museum of Memory and Heritage and those who are interested in participating in it. In a more and more changing world, museums need to be aware of the changes but always appraising the bonds, spaces and phenomena of its communities' identities and memories – even if they also change and rebuild themselves throughout time.

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The collection of old drawings of the Faculty of Fine Arts of the University of Lisbon

ALBERTO FARIA

Abstract

The collection of old drawings of the Faculty of Fine Arts of Lisbon encompasses over one thousand works, dated between 1830 and 1935. Restricted mainly to classroom exercises, these works witness the patterns of taste and the methods followed in teaching drawing at the former Academy of Fine Arts of Lisbon. The integration of the collection in the Virtual Museum FBAUL, created in the beginning of 2011, launched a precedent for inscribing other collections owned by the faculty and assured the museological identity of the collection and its place in the global network of university museums and collections.



Fig. 1 - Mainline facade of the Faculty of Fine Arts of Lisbon.
Photo: A. Faria © A. Faria

The Faculty of Fine Arts of the University of Lisbon

The Faculty of Fine Arts in the University of Lisbon (FBAUL) is housed in the Convent of Saint Francis, a building that dates back to the 13th century (CALADO 2000). The history of the Faculty of Fine Arts of Lisbon as an art teaching institution starts in 1836 with the foundation of the former Academy of Fine Arts of Lisbon. After the major educational reform of 1881, the academy became autonomous and was created the School of Fine Arts of Lisbon, which in 1992 was integrated in the University of Lisbon as Faculty of Fine Arts (fig.1).

The artistic heritage of the Faculty of Fine Arts of Lisbon is considerable, eclectic and assembles art collections of drawing, painting, engraving, mostly dated from the 19th and 20th centuries and sculptures – collections that have been recently catalogued; as well as books and the legacies of the Portuguese sculptor Lagoa Henriques and the house of the architect Ventura Terra (PEREIRA 2011, 157–172).

The collection of old drawings

The collection brings together over one thousand drawings dated between 1830 and 1935, that originated mainly from two academic institutions founded in Lisbon in the 18th and 19th century: Aula Pública de Desenho (1780) and the former Academy of Fine Arts of Lisbon (1836) (FARIA 2011).¹

Within the collection there can be found drawing class exercises awarded in the sections of architectural drawing, from prints, casts, ornaments, anatomy, drapery and nude; proofs of admission

¹ The collection of drawings was subject of study by Alberto Faria for a master thesis in museology and museography at the Faculty of Fine Arts of Lisbon, tutored by Prof. Doctor Luísa Arruda: A. Faria, A Coleção de desenho antigo da Faculdade de Belas-Artes de Lisboa (1830-1935): tradição, formação e gosto. Lisbon: University of Lisbon, Faculty of Fine Arts, 2009.

for teaching at the Academy and School of Fine Arts of Lisbon; drawings of Portuguese pensioners in the academies of Paris and Rome and studies for an architectural drawing compendium (fig. 2).



Fig. 2 - Domingos Costa (1867–1954), *Pitcher*, pencil and watercolor on paper, 52,8x35,9cm, 1894, Inv. FBAUL/101/DA, Photo: J. Viriato © FBAUL



Fig. 3 - Main frame of the Virtual Museum site © FBAUL

This collection is an important reference to understand better the models that were followed in drawing teaching and the patterns of taste that prevailed in the academic circles of former Academy of Fine Arts of Lisbon, and also in the Portuguese drawing teaching system of the 19th and beginning of the 20th century (ARRUDA & FARIA 2010).

The Virtual Museum FBAUL and the collection of drawings

The Virtual Museum FBAUL² inaugurated in the beginning of 2011 intends to reveal the artistic heritage of the faculty and its future museum³ (fig. 3). Presenting in this way benefits research and allows access to the collection by the general public. Under development, the Virtual Museum opened with the presentation of the inventory of the collection of old drawings, enhancing by this way its identity as a museological and research object (ARRUDA & FARIA 2011).

Conclusion

The incorporation of the collection of old drawings of the Faculty of Fine Arts of Lisbon in the Virtual Museum of the institution represents an important effort and the first step to ensure more easily the disclosure and visibility of the artistic heritage of the Faculty of Fine Arts of Lisbon. This also allows the institution to consolidate its scientific and educational role. The future incorporation of other art collections of the faculty in this museum will contribute positively to re-enforce its identity and guarantee a place for it in the network of university museums.

² Available at museuvirtual.fba.ul.pt (accessed December 15, 2011).

³ This museological unit is still in development although it was assigned in the statutes of the Faculty of Fine Arts in 2009.

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