

UMAC'03

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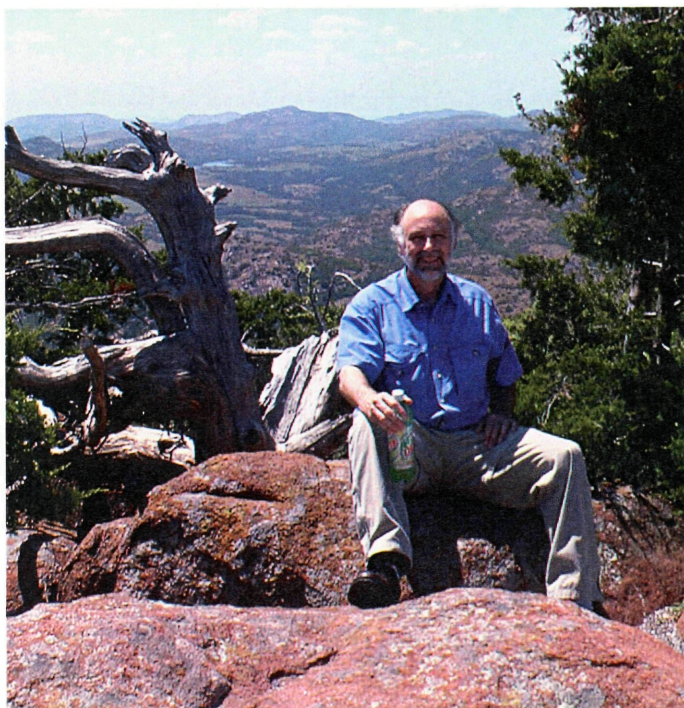
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Dear Colleagues,

It is a pleasure to comment on the Proceedings of UMAC's Third Conference. The Proceedings are a collection of international papers that are full of ideas, concepts, questions, studies, and lessons that deal with university museums. The authors are strong advocates for their museums, however, they also are proponents of engaging the community. The papers have relevance well beyond the collections and walls of the museums. University museums are emerging as institutions that are ideally suited to provide comprehensive interpretations of our world and participate in development of solutions to world problems. The strengths and resources of university museums make them highly qualified for a world leadership role, perhaps more qualified than many other social enterprises. It is a defining period for us all; what we choose to gain from university museums will transcend the years long after our conference.

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Peter B. Tirrell

UMAC: INFORMATION, IDEAS AND INTERNATIONAL COLLEGIALITY

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Abstract

The International Committee for University Museums and Collections (UMAC) identifies and enhances the strengths of university museums and collections. To do this, UMAC must find ground common to all the museums and collections in the sector. There is a dizzying array of fields of interest, sizes, staff, resources, ages and reputations. Seeing this variety, one gets the same sort of feelings as looking at the bright night sky in the countryside—feelings of wonder, confusion, fascination, variety, timelessness, futurity, life and belonging.

Universities are simultaneously places of the old and new, of the ephemeral and the permanent, of the material and immaterial. Despite such diversity, university museums and collections are places where past heritage can, for the benefit of society, interact with current thoughts and ideas. All university museums can establish meaningful links across disciplines and between communities. In this paper, I present some metaphors concerning the role of university museums and collections and explain why UMAC makes a difference to the future of both museums and individuals.

Belonging—Make Sure People Know You Belong

The feeling of belonging is important to individuals. The curators of university museums are part of the wider museum profession, but also belong to the university scene. By being part of both, they enrich both. There are common goals, opportunities and threats. Ideas and information should flow freely through museum staff. It is important that the wider museum sector and university management (including their respective political masters) understand the strategic position of university museums. Make sure your museum has that feeling of belonging to both the institution and the wider museum sector. To fail to do so is to set course for failure (Stanbury 2001). Make sure you belong to UMAC.

University Curators—Chefs of the Institution

The job of a curator of a university museum is to take objects of significance and combine them with others to enrich the campus experience. This enrichment might be a themed exhibition, an explanation of current research or an aesthetic experience. Chefs choose fine raw materials and blend them into appetizing experiences in much the same way. Thus, curators are the active, creative and innovative agents that enliven, attract and make new meaning for communities, both internal and external. A curator and a chef both require knowledge, confidence and contacts. It is UMAC's aim to bolster confidence by providing access to a wide range of relevant information tailored for the environment of the campus, and a list of colleagues in many countries. So there you have it—sample recipes, people ready to

help: join UMAC, gather your local ingredients and make your museum a uniquely memorable experience.

University Museums—Knowledge Exchangers

University museums follow recent research and new areas of study and relate them to the collections. University museums are the nodes through which information passes on to a wider public. Consider, for example, attracting students turned off by micro subjects such as molecular biology and reconnecting them with whole animals and plants, or mounting a changing exhibition in the local hospital.

University museums are the only museums that have liberal access to the inventive, fresh ideas of students and the experience and deep understanding of not just a few researchers, but hundreds or thousands of them—more than any other type of museum could hope to employ. Exhibitions originating from the university's research work or from the suggestions of students broaden your constituency and increase advocacy for your museum.

Collections are no longer the *raison d'être* of museums, use and enjoyment of them is (Hatton 2002). The daily work of a director of a large museum is one of negotiating—taking ideas forward and delivering change—it is rarely dealing with objects. The university curator will ensure the survival of his or her museum only by practicing similar skills. Safeguard the objects by all means, but concentrate on people. Innovative curators question circumstances, ignore old debates and develop new audiences. University museums exist to link disparate fields of knowledge, people and ideas. UMAC is the agent to infuse intellectual excitement

into exhibitions where knowledge is exchanged and extended.

University Museums—A Counter to Increasing Specialization

University museums are bastions of liberal education. Students can visit the museum to explore broad themes, widen contacts, follow developing research, develop skills not formally taught, make illuminating connections between intellectual fields and relax in a non-threatening learning environment. Curators make important contributions by explaining the development and evolution of the arts and sciences, thus providing historical meaning for which there is no time in formal coursework. University museums are the fasteners that connect disparate pieces of knowledge into lucid maps.

One of the greatest opportunities for students is the lure of seeing real objects instead of the digital images of distance or web-based courses. University museums are an oasis of the real in the desert of the digital world.

Some university museums now offer short supplementary courses to replace basic information now omitted through the streamlining of tertiary education. And isn't teaching from the collections how universities started in the first place? *Plus ça change!*

University Museums—Enzymes of Interdisciplinary Action

No one doubts the worth of the university library as an information resource. Yet, many people fail to realize that objects in a university museum contain information that can be used across disciplines. Thus, a dried insect can be an art object, a source for pesticide research in a new housing development, a stimulus for aeronautical studies, a chemical source for the extraction of a furniture polish, a pivot or stimulus for a short story, a key specimen in evolutionary studies or an exhibit in a welcome display for new overseas students. The insect is no longer of interest only to the biologist. Diverse and multicultural audiences view and use the same object in a range of ways. It is a function of UMAC to point this out, and it is vital, if university museums are to survive, that university museums are promoted as resources for more than one community and more than one field of knowledge. University museums have the potential to act as catalysts in the formation of new knowledge from old.

Listening to visitors and their points of view is an inspiration for new interdisciplinary exhibitions, as reported at this and other conferences. UMAC is the loom that curators use to weave the strands of knowledge produced by researchers, thinkers and creative people into material that will be appreciated by, and will attract, diverse communities.

University Museums—Signposts at the Crossroads of Community and Campus

University museums are open doors onto the campus. Many in the community fear coming onto the campus without a sufficient reason or an invitation. University museums connect visitors and university staff by introducing prospective students, answering or forwarding questions, facilitating donations, providing community feedback, initiating contacts between museum staff in other sectors and academics, finding speakers and undertaking cooperative research. These functions of university museums deserve highlighting because they help raise profile and facilitate links. University museums are the very essence of what universities are all about—providing the institution with relevancy in its various communities. UMAC is the *agent provocateur* pointing to and facilitating this process.

University Curators as Propagators of Ideas

The curator can be seen as a gardener (Worton *in litt.* 07.2003) who plants seeds of knowledge that grow in the mind of students as the months and years pass, until the graduate cannot remember a time when this gradually accumulated appreciation of heritage was not present. University curators have an unrivalled opportunity to make their campus flower with relevance for the wider community as life fills with unrepairable and mysterious black boxes, chemicals replace mechanical and surgical procedures and post-modern installations seemingly render brush skills obsolete. The curator's role is to explain and make relevant the paths of development, evolution, social consequences and results of research. University curators have an opportunity to seed the soil of students' imagination at a most receptive and fertile stage. This enrichment of experience is particularly important for students whose experience may be limited, but their creativity is developing actively. UMAC helps to identify these and other benefits that enrich the communities served by the university.

UMAC—An Agent Linking Curators and Ideas

UMAC is important because one of its tenets is equity of knowledge: equity among its members, but also equity for all concerned with university collections at whatever level, wherever located. UMAC strives to reach university curators, university management, politicians, whether in government or not, and the wider museum sector. UMAC has status as an official committee of the International Council of Museums (ICOM).

UMAC is important because it attempts to redress a lack of knowledge. It develops definitions, procedures and policies. With its international contacts, it can help those who seek assistance. Furthermore, UMAC respectfully proffers information where it feels that there is a lack of understanding about the nature of university museums and collections. UMAC practices advocacy.

UMAC is important because it stimulates discussions, fosters international partnerships, develops links and advances knowledge. It regards quality of individual experience as essential in all its dealings. UMAC believes in diversity of approach. UMAC attempts to reach its goals by a series of successive small steps. UMAC is young, growing, active and practical. It has a proud publication record. It is determined to improve its web site to make information about university museums more readily available. Demonstrable action, as for any museum (Glaister 2003), is important for UMAC, too.

I urge you to participate in UMAC's working parties and discussions. Just a few small, new steps by you will make all the difference. Please consider joining a working group. Your action for UMAC locally will bring you significant insights and global renown for your museum. Let us have much to report to many members at our next conference in Seoul, Korea, where the theme will be *Museums and Intangible Heritage*. With your help, we can assist our managerial and political masters to an understanding of the value of university museums to their various publics. Together we can assist our colleagues to face the future with confidence.

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ICOM AND UMAC: A JOINT VENTURE

Gary Edson, Member, Executive Council of ICOM, Executive Director, Museum of Texas Tech University, Lubbock, Texas. U.S.A.

Mr. Chair, dear museum colleagues, ICOM friends, good evening! It is a great pleasure to be in Norman, Oklahoma.

First, let me extend a welcome to you on behalf of the ICOM Executive Council and Jacques Perot, our President. Thank you for allowing time for me to speak.

We, the ICOM Executive Council, are pleased you have come together for this meeting of the International Committee of University Museums and Collections (UMAC). Not only is this committee important to the International Council of Museums as the representative body of a significant part of the museum community, it is important because, as many of you have learned, it is through the International Committees that we as members of ICOM have the opportunity to interact with colleagues from around the world. A stated objective of your Committee is to provide

its members with a forum to identify partnership opportunities concerning the resources in the collections, to share knowledge and experience, and to enhance access to the collections. The aim is to protect the heritage in the care of universities. (International Committees 2004)

As a director of a university museum, I endorse those objectives enthusiastically and commend you for your vision.

As you may know, ICOM has 29 international committees and each is devoted to the study of a particular type of museum or a specific museum-related discipline. Composed of ICOM members who request membership, international committees are exclusively professional bodies. Through its international committees, ICOM achieves its major objectives: the exchange of scientific information at an international level, the development of professional standards, the adoption of rules and recommendations and the realization of collaborative projects.

People often wonder which is the largest international committee; well, according to the latest figures I have from the June 2003 meeting, the three largest international committees are ICOM CC, the conservation committee, CECA, education committee, and ICOFOM, the museology committee. UMAC is not the smallest in either active or voting members and it is developing quite nicely as a young committee. That is made evident by this meeting.

According to a decision of the Executive Council at its 102nd session, held on December 9-11, 2002, every ICOM member has the right to become a member of one international committee with full voting rights. Membership in this committee is free and includes all

services rendered by the committee, but the committee has the right to charge fees for specific events, such as the one relating to this meeting. In addition, every ICOM member has the right to become a member of other international committees, but without voting rights. International committees can request financial contributions to cover expenses from those members registered under this category.

ICOM has at present 115 active national committees. ICOM members are often interested to know which of the 115 committees are the largest. The actual number of national committees seems to change weekly as some are lost for various reasons and others are added. We usually have 123 or 124 countries represented, but not all have adequate membership to constitute a national committee. Nevertheless, the largest national committee is Germany with over 2200 members. The second largest is France, followed in descending order by Switzerland, The Netherlands, United States, Denmark, Spain, Israel, Sweden, The United Kingdom, Belgium, Austria, Finland and Norway. It is easy to see from this list that Europe has many of the largest national committees. There are over 13,000 ICOM members in Europe.

The number of ICOM members is increasing daily. According to the ICOM web site, there are 17,000 members, and they come from 140 different countries. The membership of ICOM continues to grow at about 6 percent per year.

Perhaps some of you are unaware of how ICOM works. So, without going into great detail, I will give you a brief overview. ICOM is built on the membership of the National and International Committees. They elect the officers that serve on the Executive Council, determine the agenda for the Advisory Committee—which, in turn, places issues before the Executive Council—approve the budget, develop the resolutions for inclusion in the triennial strategic plan and select the person to chair the Advisory Committee.

The next election of officers will take place in Seoul, South Korea, in October 2004. The slate of candidates is listed on the ICOM web site, and will be circulated by ICOM prior to the election. Because your International Committee votes in the election, it behooves each of you to review the list of candidates and let your representatives know your preference. There are 21 candidates for the Executive Council and nine are to be elected. There are two candidates for President, three for Vice-President and two for Treasurer.

At the triennial conference in Seoul, the membership also will vote on a newly revised Code of Ethics and the Statutes in a rewritten form, and will

determine the definition of “museum.” I encourage you to attend the triennial or to let your committee leadership know your wishes about these issues.

Although ICOM is over 50 years old, or perhaps because it is over a half century old, it is an evolving organization. ICOM must change to meet the needs of contemporary society and the museum profession in the service of that society. New visions and new attitudes for the future role of museums—addressing social and environmental issues; advancing academic research and public education; promoting higher standards of collections care and retention; and defining international ethics for use of intellectual and cultural property—are imperative, and unless the ICOM membership takes a leadership role in this initiative, others will impose their vision and ideas on our activities.

As an element of the changing museum world, university museums and collections must reflect the growth of the museum profession; the expansion of the museum community to include a growing number of diverse institutions, programs, and activities; the inclusive attitude of audience development; and a greater sense of social as well as academic identity and responsibility.

Partly in response to these changes, many universities have given attention to the extraordinary educational potential of museums. They have come to realize there is a need for museums and collections to represent the diverse academic activities of their institutions, and for maintaining the unique nature of their research initiatives. The form these museums take is evolving at a rapid rate, but often with a lack of direction and mission. University museums have to change, or refocus, as they confront new economic demands, and those changes will influence the ability of university museums to survive, as they exist today, and as they grow in a different and more demanding intellectual environment.

The university museum community has a unique role in addressing both informal and formal educational opportunities. University museums and collections have the extraordinary role of serving as the intermediary between the academic and lay communities. Our museums and collections are the truest keepers of natural and cultural resources.

The university museum of the future may follow this tradition-bound path of predictability or seek new venues for fulfilling its museological role. If the university museum is to be more accessible and purpose-oriented, it must have a holistic nature, emphasizing the importance of the whole and the interdependence of its parts. The university museum of the future must redefine its mission to identify outcome objectives for information exchange, service and research. It must define its public role to include all elements of the university, as well as the public. It must find the means for being common to all inherent purposes.

The ultimate question for the university museum of the future may be one of identity. The mission of a museum grows out of tradition and is shaped by need; if the university museum fulfills no definable need, it will have no reason for existence. And, if its primary function is to be a repository for teaching and research collections with no “service” orientation, the viability of the institution will be in jeopardy.

University museums have the opportunity to provide leadership and direction for the international museum community. The challenge is to interpret and anticipate the requirements of society because museums mirror society. As the technological, multicultural, entrepreneurial and expedient nature of society increases, it is reasonable to assume the museum community will follow. These tenets appear to be gaining in importance worldwide, so no nation or group, regardless of social or economic status, is exempt from their influences.

ICOM and the International Committees such as UMAC are established for addressing these issues. They bring together persons with commonly shared interests and objectives. I personally, and as a member of the ICOM Executive Council, thank you for your participation in this conference and wish you good luck for your meeting. I congratulate each of you for your dedication to university museums and collections.

Thank you, Mr. Chairman and colleagues

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VIRUS AND THE WHALE: EXPLORING EVOLUTION IN A MUSEUM COLLABORATION

Judy Diamond, Associate Director and Professor; Amy Spiegel, Research Professor; Debra Meier, Administrative Coordinator; Sarah Disbrow, Consultant, University of Nebraska State Museum, Lincoln, Nebraska, U.S.A.

Abstract

A major new collaboration of museums in the U.S. will teach the public about current research in evolutionary biology. This project, entitled Explore Evolution, combines the strength of interactive exhibits, Web activities and outreach programs for youth to feature seven influential research projects on organisms ranging in size from the smallest, HIV, to the largest, a whale. Launched in 2003 and funded by the Informal Science Education Program of the National Science Foundation (NSF), Explore Evolution is one of the most comprehensive informal education projects in the U.S. to focus on teaching about evolution research.

The concept of biological evolution is one of the most important ideas ever generated by the application of scientific methods to the natural world. (Bruce Alpert qtd. in National Academy of Sciences 1999)

Introduction

Concepts about evolution are far from being fully understood or accepted by much of the American public. For example, about half of adult Americans believe that God created Adam and Eve to start the human race (Numbers 1982), and about the same percentage believe that the earliest humans coexisted with dinosaurs (National Science Foundation 1999). A 1993 Gallup Poll showed that 47 percent of Americans continue to believe that God created man pretty much in his present form some time within the last 10,000 years (Numbers 1998). Approximately 45 percent of college students surveyed agreed with the statement that some races of humans are more evolved than others (Ahlquist & Cronin 1988). There are regional differences as well: college students in the Midwest and South are significantly less likely to give scientific answers to questions about evolution than students from other parts of the U.S. (Ahlquist & Cronin 1988). Anti-evolution movements in states like Kansas and Ohio have been well publicized, but there are many more subtle efforts that reduce school time spent on learning about evolution. Many school districts throughout the Midwest quietly are decreasing the time spent on teaching evolution. For example, the Lincoln Public Schools, a Nebraska school district of over 31,000 students, has recently shifted one of its science requirements from rocks and fossils, where evolution was taught, to rocks and minerals, where it is not. In this district, ideas about evolution now are not taught until students are 14 and older.

Museums and other informal science education institutions play an important role in making scientific ideas available where the schools fail to do so. The

Explore Evolution project combines the strength of museum exhibits and informal outreach programs to reach a broad sector of the public in the midwestern United States. Launched in June 2003, this project is one of the most comprehensive informal education projects in the U.S. to focus on teaching about evolution research. This project is designed to create a difference in the ways that the adult and youth audiences think about evolution and the role of scientific research in developing new ideas. Our aims for museum audiences are to create an understanding of evolution as a topic of current and ongoing scientific research, an awareness that ideas about evolution are accessible and relevant to their lives, an awareness of the diversity of scientists, including women and minorities, who conduct research on evolution and an appreciation for the role that research on evolution plays in understanding the natural world. We plan to show adults and youth that evolutionary research is a dynamic field, supported by multiple lines of scientific evidence, in which researchers are constantly making new discoveries that strengthen our understanding of how life evolves.

Museum Collaboration

Explore Evolution is a comprehensive museum-based program that will give the public and educators opportunities for understanding the science underlying current concepts in evolution. It is an outgrowth of a decade of discussions among the staff of museums in the Midwest on how to be more proactive in teaching evolution (Diamond 2000). The exhibits and outreach components of the project will be disseminated through three methods. First, a consortium of six major science museums will display permanent exhibits to their public audiences and disseminate outreach materials through their educational programs. Second, activities based on the exhibits will be disseminated throughout 4-H Youth Development, the largest youth organization in the U.S. Third, a national science education publisher will

disseminate the Explore Evolution activity books widely to formal and informal audiences.

All of the participating museums will take part in development decisions, including final topic choice and feedback on prototypes. The museums will receive and display copies of the final exhibits, and also disseminate the activity units through their educational programs and web sites. The combined annual attendance of these museums in six states is over 1.8 million.¹

Formative Approach to Teaching About Evolution

An important component of the Explore Evolution project is an ongoing evaluation of the most effective means to communicate concepts about evolution. We will present research on evolution in a way that is consistent with students' abilities to understand the concepts (Evans 2000, 2001). As suggested by the American Association for the Advancement of Sciences (AAAS):

Poor reasoners tend to retain nonscientific beliefs such as "evolutionary change occurs as a result of need" because they fail to examine alternative hypotheses and their predicted consequences, and they fail to comprehend conflicting evidence. Thus, they are left with no alternative but to believe their initial intuitions or the misstatements they hear. (2001)

According to Evans, by the end of elementary school, children are ready to consider and cognitively accept the concepts of evolution (2000, 2001). Developmentally, this early adolescent time is critical to accepting the concept of evolution.

This project integrates front-end and formative evaluation into the development process for the exhibits and outreach materials (Diamond 1999). The evaluation builds on previous and current work being conducted on what the general public and museum visitors understand about evolution, and about science in general (Diamond et al. 1987; Evans 2001; MacFadden & Camp pers. com. 2004). Formative evaluation and subsequent visitor research will allow visitor feedback from various regions in the U.S. to guide the presentation of information. Several concepts about evolution will require intensive formative development to ensure that they are presented clearly. For example, middle school and high school students have difficulty with the word "adaptation," because they often assume that adaptations result from some overall purpose, design or intent. They also confuse non-inherited traits acquired during an individual's lifetime with adaptive features that are inherited in a population. Students also have difficulty understanding that change in a population results from the survival of a few individuals that preferentially reproduce, not from the gradual changes of all individuals in the population (American 2001). Evans

(pers. com. 2004) suggests that even the most targeted instruction aimed at imparting Darwinian theory fails to change students' intuitive concepts of species change.² She suggests that interventions that target both students' naïve epistemology and their intuitive biology appear to be more successful in effecting conceptual change in the classroom. The Explore Evolution project will combine the drawing power of entertaining and well-designed interactive exhibits and activities with careful formative research to create a positive and understandable learning experience about evolution.

National Science Education Standards

Explore Evolution creates a learner-centered communication, education and assessment environment built around exploration, identification with strong role models and the development of critical thinking. The Explore Evolution exhibits and activities incorporate many of the skills required by the National Science Education Standards. By including skills from the standards, the Explore Evolution project builds a bridge between learning at school and extracurricular learning—the most effective way for children to retain newly acquired knowledge and maintain new interests sparked by their science explorations.

The project's content falls within the content standards for students 10 to 13 years of age (U.S. school grades 5–8) in life science, science as inquiry, unifying concepts and processes, earth and space science, science and technology and science in personal and social perspectives (National Research Council 1996). Life science content standard C for 10–13-year-olds (U.S. school grades 5–8) under Diversity and Adaptations of Organisms specifies:

Biological Evolution accounts for the diversity of species developed through gradual processes over many generations. Species acquire many of their unique characteristics through biological adaptation, which involves the selection of naturally occurring variations in populations. (National Research Council 1996)

Explore Evolution Exhibits

Similar evolutionary principles operate on different kinds of organisms. To emphasize this point, the Explore Evolution exhibits will be organized along a transition from the smallest organism to the largest. Each exhibit unit will include a section about the scientist, an explanation of how this particular research project demonstrates an important idea in evolution, an explanation of how our ideas of this evolutionary topic have changed since Darwin's time and a participatory opportunity to investigate this research project and its relevance to visitors' lives.

The Explore Evolution exhibits feature seven research projects, and each of the lead research scientists participates in and supports the corresponding project. We chose research studies that were highly influential; they are cutting-edge investigations published in leading scientific journals. Each of the research projects fundamentally changes ideas about evolution that have been around for a long time, and they represent ideas that are supported by multiple lines of evidence. We also felt that, although the science is complex, each of the projects can be made accessible to museum audiences.

At the outset, an executive group composed of representatives from the six museum partners met to review a detailed proposal for how each exhibit is to be built. The feedback from the partners on the detailed plans has shaped the development of the exhibit prototypes. These prototypes will be tested with visitors and then modified accordingly (Diamond 1999). The executive group will then consider the results of the formative evaluation when making decisions about the design and production of the finished exhibits. Explore Evolution includes the following exhibits.

HIV, Master of Disguise—One of the deadliest viruses in the world, HIV—the virus that causes AIDS—continues to elude medical efforts to eradicate it. Although initially susceptible to a variety of drugs, the virus has evolved rapidly, enabling it to dodge every drug in our biotech arsenal. This exhibit features the work of Charles Wood, Director of the University of Nebraska Center for Virology. Wood studies the mechanism of viral evolution in search of a vaccine against HIV. In this exhibit, visitors explore what a virus is, interact as a virus inside a host cell, and look at “snapshots” of HIV as it evolves from a mother to her infant.

Diatom, One-Celled Wonder—In core samples taken from Yellowstone Lake, Sherilyn Fritz and Edward Theriot discovered the origin of a new species, a single-celled diatom named *Stephanodiscus yellowstonensis*. Their work documents the most rapid evolution of any species in the fossil record. Visitors to this exhibit examine lake core samples to experience first hand the excitement of viewing how a new species emerges in response to climate change.

Fungus, Partners for Life—In dark gardens underground, leaf-cutter ants grow a fungus for food. The ants groom their crop and protect it from pests as carefully as any farmer. The partnership has lasted more than 50 million years. Biologist Cameron Currie from the University of Kansas discovered that this system actually involves four coevolved partners: the ant, the fungus, a parasitic mold and a bacterium. In this exhibit, visitors take a powers-of-10 video tour of an ant fungus garden and investigate an evolutionary “arms race” in Petri dishes.

Fly, Explosive Evolution—From one ancestral species of fruit fly that blew ashore on the remote islands of Hawaii, more than a thousand species have evolved.

Kenneth Kaneshiro, from the University of Hawaii, explores the ways that sexual selection has shaped the evolution of *Drosophila* diversity in Hawaii. Visitors to this exhibit investigate the courtship of fruit flies and other features of their biology to understand what drives the remarkable diversity of this group.

Finch, Rapid Response—Research by Rosemary and Peter Grant sheds new light on Darwin’s finches. Their study of finch populations on the Galapagos Islands demonstrates that evolutionary changes in bill size and shape occur very rapidly in response to severe environmental changes. In this exhibit, visitors take bill measurements of Galapagos finches and learn how selective effects of environmental change, acting through abundance of different food types, influence variation in finch bills.

Human, Family Ties—Genetically speaking, chimpanzees are close relatives of ours, sharing more than 98 percent of our DNA. Humans and chimps may have shared a common ancestor as recently as 5 million years ago. Henrik Kaessmann and Svante Pääbo, from the Max-Planck Institute for Evolutionary Anthropology, use the techniques of molecular biology to investigate the origin and evolution of the human family. This exhibit invites visitors to explore how modern molecular genetics give us insight into the relationship between humans and our closest relatives, the apes.

Whale, Walking Giants—Digging for fossils in the desert of Pakistan, Philip Gingerich from the University of Michigan made a series of startling finds. They demonstrate that whales evolved from 4-legged mammals much like the ancestor of the modern-day hippo. Visitors to this exhibit travel back with Gingerich to an ancient shore—the cradle of walking whales—and investigate some of the earliest known fossil whales and his most recent discovery, *Rodhocetus*.

Explore Evolution Outreach

The outreach component of the Explore Evolution Project consists of an activity book based on the University of Nebraska State Museum’s award-winning *Wonderwise, Women in Science* kits. These kits, funded by grants from the Howard Hughes Medical Institute and the NSF, received national awards for excellence, including the 1998 top award for children’s programming given by the National Education Association, the largest educational organization in the U.S. The *Wonderwise* kits have been used by over 11 million youths throughout the U.S. and Canada.

Each of the seven Explore Evolution activity units will be designed for 10 to 13-year-olds as a series of inquiry-based investigations into one topic in evolution. Each unit will be supported by the Explore Evolution exhibits and a web site that includes background information on the scientist, interactive extensions of

the activity, links to local and national science education standards and links to other evolution sites.

The Explore Evolution activities will be developed by the nationally-known curriculum writer and author, Linda Allison. She is the author of over a dozen science activity books, including the Wonderwise activity books and *Blood and Guts*, one of the only science curriculum projects to be on *The New York Times* best selling list (Allison 1976). The activities will be inquiry-based (Tobin 1993), easy to use, accessible to leaders and youths with no science background and constructed from readily available materials. All activities will undergo formative evaluation to ensure that the materials are designed specifically to enhance youths' understanding of evolutionary concepts. Through this project, museum visitors and 4-H youth have the opportunity to make connections between collecting data and applying their analysis and deductive reasoning to real-life situations, and to gain an understanding of the central relationship of evolutionary ideas to all fields of science. The activities encourage autonomy in the learning situation by embedding the reasons for learning in the activity, thereby helping learning to occur in a real-life context that mirrors a technologically oriented society (Bybee 1997; Tobin 1993).

A strong network is already in place for the dissemination of Explore Evolution outreach materials. A consortium of 4-H youth programs throughout the Midwest currently disseminates the Wonderwise project (Diamond et al. 1996; *Wonderwise*). This network also serves as the basis for the dissemination of the Explore Evolution outreach materials. Wherever possible, we will establish connections between the partner museums and state 4-H programs to integrate the exhibits and outreach parts of the project. The 4-H Youth Development organizations are logical partners because they provide a vast network of youth services throughout the U.S., they share many common educational goals with museums, which emphasize learning by doing, exploration and inquiry, and they currently have no curriculum materials on evolution. The Explore Evolution project will reach a wide diversity of youth, including over half a million who will experience the activities through 4-H clubs, camps, schools and after-school programs.

The Explore Evolution project will be completed within three years. By the end of the second year of the project, participating museums will receive a set of the completed exhibits to have in their permanent collection for display on an ongoing basis. Some of the museum partners plan to incorporate these exhibits into existing galleries on related topics, while others plan to display them in a separate gallery. By the project's third year, the participating youth groups will have begun youth leader professional development. The results of the project's research and evaluation studies will be published for dissemination to educators and other researchers

interested in how to make effective learning tools to teach about evolution.

The Explore Evolution collaboration serves as a model for how museums can work together to create significant educational experiences for the general public. Explore Evolution has created partnerships between museums, youth groups and scientists and is incorporating careful learning research to develop educational materials on this difficult and important topic.

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Notes

¹ The following museums form the Explore Evolution consortium: Exhibit Museum of Natural History at the University of Michigan, Kansas Museum and Biodiversity Center at the University of Kansas, Sam Noble Oklahoma Museum of Natural History at the University of Oklahoma, Texas Memorial Museum at the University of Texas at Austin, University of Nebraska State Museum and the Science Museum of Minnesota.

² See also Bishop & Anderson 1990.

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EXPLORE EVOLUTION AT THE UNIVERSITY OF MICHIGAN

EXHIBIT MUSEUM OF NATURAL HISTORY

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Abstract

The Exhibit Museum of Natural History at the University of Michigan is one of six partner museums in the NSF-funded Explore Evolution project. Participating museums will tailor their involvement in different ways to achieve various institutional goals. This article is a short discussion of the Exhibit Museum's plans to use the Explore Evolution exhibits to enhance visitor understanding in its largest exhibit hall, as well as to supplement the new exhibits with related displays on University of Michigan research.

Introduction

How will the six museums in the Explore Evolution consortium leverage their participation in the project to advance their goals?¹ It may be too soon to tell about the project's research and youth outreach components, but at a September 2003 meeting of the group, the partner museums shared preliminary plans for installation of the exhibits. The Exhibit Museum of Natural History at the University of Michigan (UM) plans to improve its current permanent exhibits with the installation of Explore Evolution, and to extend the project exhibits with the addition of three kiosks on current UM research in evolutionary biology. This supports an important strategic goal for the Exhibit Museum, which is increasingly asked to support the research mission of the University by communicating UM research findings to the public.

The Hall of Evolution

Some of the Explore Evolution consortium member museums plan to install the complete set of exhibits in separate, dedicated gallery spaces. One museum plans to break up the set and install individual exhibit stations at various locations throughout its exhibit space. At the Exhibit Museum, the Explore Evolution exhibits will be integrated into the entry area for the Museum's largest and most popular exhibit hall, where they potentially will have a great impact on the visitor's experience.

The Exhibit Museum has approximately 22,000 square feet (2000 square meters) of exhibit space, of which about 9100 square feet (850 square meters) are devoted to the "Hall of Evolution" (Fig. 1). This large, two-story hall contains numerous complete skeletal mounts and extensive fossil displays and habitat dioramas, and is very popular because of the dinosaur displays. (Locally, the Museum is known fondly as "The Dinosaur Museum.") The Museum has been slowly updating the exhibits, by necessity over many years, because of the small size of its exhibit staff (2.25 FTE). Some of the displays are 40 years old; others are more recent. None of these displays, old or new, directly explains exactly what evolutionary science is,

despite the name of the Hall. Exhibit text is written with the assumption that the visitor already understands the concept of evolution. This has not been a conscious choice; it is perhaps an artifact of assumptions made about the knowledge that university museum visitors bring with them. However, we are delighted to have the opportunity to correct this situation through participation in the Explore Evolution project.

The Explore Evolution exhibits will be installed at the Exhibit Museum in a large, funnel-shaped space at the entry to the Hall of Evolution. Visitors will have to walk through the Explore Evolution exhibits to gain access to the rest of the Hall. The introductory station of the Explore Evolution exhibits thus will serve as an introduction to evolutionary science for the entire hall. The seven Explore Evolution exhibit stations, which feature current research on organisms ranging from the HIV virus to prehistoric whales, will illustrate current thinking in evolutionary science. Visitors who take time to read, interact and think about the Explore Evolution exhibits will be better prepared to visit the rest of the Hall, where they may bring this new information to bear on exhibits that assume prior knowledge.

University of Michigan Research

As with many university natural history museums nationwide and internationally, the Exhibit Museum has been challenged by University administrators to demonstrate its contributions and relevance to the core teaching and research missions of the University. The Exhibit Museum has unusual difficulty quantifying its contributions because, as its name suggests, the Museum does not have its own collections, curators or faculty. Created in 1956 as an administrative entity separate from the four UM natural science research collections (the Museums of Zoology, Paleontology, Anthropology and the University Herbarium), the Exhibit Museum has been devoted to providing exhibits and educational programs in natural history and anthropology for the University community and the general public. Now there is increasing pressure on the Museum to serve as a "window" onto UM research, and to explore the use of media beyond the exhibits and school field trip



Fig. 1. The Hall of Evolution. Photograph by Dan Erickson.

programs that have been the Museum's bread and butter for decades. This pressure may result in considerable change at the Museum in the coming years.

In the near term, however, the Explore Evolution project offers a welcome opportunity to showcase and disseminate the research findings of UM paleontologist Philip Gingerich, curator and director of the Museum of Paleontology and professor of Geological Sciences. Gingerich's work on the evolution of whales is represented in one of the Explore Evolution stations, and therefore will be installed in five other museums around the midsection of the country, making it possible for a much wider audience to learn about his work. At the Exhibit Museum, the Explore Evolution station on Gingerich's work will serve as a preview to a more extensive exhibit on whale evolution located further back in the Hall of Evolution. Both exhibits present information about the fossil evidence Gingerich has found which shows that whale ancestors were terrestrial mammals. The inclusion of Gingerich's work in the Explore Evolution exhibits will help local audiences appreciate the significance of his research as it is juxtaposed with the work of other prominent American and international scientists.

Evolution in Action

In addition to Gingerich's research, the Exhibit Museum plans to highlight the work of another UM researcher in association with the Explore Evolution exhibits. Professor of Ecology and Evolutionary Biology David Mindell—curator in the Bird Division and director of the Museum of Zoology and Herbarium—and his students have been working on projects which apply evolutionary science as a tool to solve real-world problems. Mindell and the Exhibit Museum's Director of Education, Kira Berman, have received funding through the Faculty Seed Grant program of the UM Life Sciences, Values, and Society Program and the Office of the Vice President for Research for a project entitled, "Evolution in Action: A Museum-based Model for Communicating University Research Findings to the Public." The goal of the project is to help the public understand current UM research in evolutionary biology and genetics by initiating and extending public dialogue on the ethical and public policy implications of recent work in evolutionary biology. Three exhibit kiosks are planned, and after initial display in the Museum's

Rotunda lobby, the kiosks will be installed in association with the Explore Evolution exhibits to help visitors understand how evolutionary science has real-world applications in resource management, medicine, policy and law. The three research topics are conservation genetics, forensics and infectious diseases and artificial selection. Work on these exhibits will begin early in 2004, and should be complete by the time the Explore Evolution exhibits are ready for delivery. As space and opportunity permit, additional displays on current UM research may be added to the exhibit area at the entrance to the Hall of Evolution in the coming years.

Use of Thematic Content

The Exhibit Museum will launch the Explore Evolution exhibits in the context of an accompanying museum theme semester on evolution, following an established pattern of theme semesters during winter term.² Theme semester programming is targeted at a variety of audiences, including adults, University students, families and children, and includes a lecture series, winter and spring break drop-in activities, a Discovery Day, a partnership with public libraries in our region and collaborations with relevant partner organizations. We will make a pitch to the "Ann Arbor Reads" Committee to select a book on evolution for the annual community-wide reading program held each winter. In addition, we will update our ongoing "Prehistoric Life" school tours to incorporate information about the new exhibits into the tour curriculum.

Explore Evolution at the Exhibit Museum

The Explore Evolution project provides the UM Exhibit Museum the opportunity to enhance its current exhibits and to meet the institutional goal of showcasing UM research in the natural sciences. The new exhibits will provide the thematic organizing principle for new programming, both short- and long-term. The project's other components, audience research and outreach to youth, are as-yet unexplored opportunities for further strategic action. We look forward to exploring these additional opportunities to advance our goals through participation in the Explore Evolution project.

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Notes

¹ The NSF-funded Explore Evolution project is described in detail in the preceding article by project director Judy Diamond et al.

² Winter term theme semesters include Mars (2003), Biodiversity (2004), Ice Age and Mastodons (2005) and Evolution (2006).

UNIVERSITY MUSEUMS AND COLLECTIONS OF NATURAL HISTORY

Karl L. Hutterer, Executive Director, Santa Barbara Museum of Natural History, Santa Barbara, California, U.S.A.

Abstract

Natural history museums and collections at American universities have been in decline for the past 30 years, due in part to increasing constraints on the financial support framework and the perception that natural history museums may be no longer central to the mission of universities. This paper disputes the validity of this assumption and suggests strategies for strengthening the position of natural history museums within the academic structure.

Introduction

Over the last two years, great concerns have arisen again over the future of natural history museums and collections¹ at a number of American universities.² Investigation has shown that the situation is not uniform, but varies from case to case. In some instances, museums and collections have faced, and continue to face, threats of outright closure; in other cases, they are affected by severe budgetary cutbacks by their parent organization, causing the elimination of all public programs or the termination of curatorial positions, entailing drastically reduced collections care and curtailment of access to the collections; in yet other instances, budgetary reductions of operating funds are relatively minor, without serious overall impact.

Several factors affect the relative well-being of individual institutions. These factors do not include the size or quality of a given museum, but rather the museum's structural position within the university organization, and the degree to which a museum derives a significant portion of its operating funds from dedicated endowments. On the whole, there is no doubt that an increasing number of university-based natural history museums and collections are currently at risk to such an extent that many members of the natural history community speak of a crisis.

The pressures university-based natural history museums find themselves under are not new. The position of natural history museums at universities has been in steady decline over the past 30 years, punctuated by the closure of some museums and divestiture of significant collections during times of budgetary difficulties, particularly budgetary problems caused by cyclical recessionary economies. American universities, even those generally classified as "second-tier" and "third-tier" institutions, are large corporate structures. Within these large enterprises, the internal allocation of relatively scarce resources is always a highly politically charged issue, even during good times. The internal competition for resources increases dramatically during tough times, and it is at those times that politically weak units are particularly at risk. Such weak units are those viewed as being less central to the university's

"core mission" of teaching and research, those regarded as being not at the cutting edge of current scientific research, or those seen as less likely to generate high levels of external grant support. Rightly or wrongly, university administrators often judge natural history collections and museums as programs falling into these three categories.

Unfortunately, regardless of whether times are good or bad, the cost of operating our vast university systems, as well as the cost of maintaining our inexorably growing collections, continues to go up. Thus, while the competitive climate may relax somewhat in the short-term, if and when the overall economic climate improves again, the general long-term trend is likely to be a continuing increase in the competition for allocation of support in operating budgets, capital programs and personnel resources within universities. In other words, the long-term forecast is that the erosion of university-based natural history museums will continue and may eventually make these institutions an endangered species, unless concerted strategic actions are taken to address the problems underlying their perceived or real weaknesses within university structures. It would be a grave mistake simply to blame the secular trend on the ill will of poorly informed university administrators, while failing to recognize and address the deeper causes of the issue.

This is a complex situation, but there are, in essence, three basic challenges. The first is the continuously increasing cost of the human and material resources needed to care for our collections and the research associated with them. This continuous cost increase is caused, in part, by the fact that the collections continue to grow, as they should, if the institution is healthy, active and dynamic. However, even if the size of collections were to be kept constant, costs would continue to increase, because of the growing demands for better conservation measures, innovations in scientific technology and general inflationary pressures in the economies in which our institutions are embedded.

A second challenge results from the fact that university systems also face ever-increasing economic challenges. Expectations about what universities deliver

in the form of education, research and public services have expanded greatly in recent decades, while public funding, as measured as a percentage contribution to overall operating budgets, has declined continuously. This has led publicly-funded universities to look increasingly to earned revenues (by raising tuition and other fees) and to compete aggressively for private support. The battle for the dollar is fierce, within and between institutions, and the spoils are likely to go to those university departments that have the strongest alumni support, can gain attention through spectacular research, generate the largest enrollments and have strong linkages to business and industry. Natural history museums are not always well situated in this battle.

The situation is made worse by the third challenge: taxonomy and systematics, fields that have long been the foundation of scientific research in natural history museums (as well as material culture studies in anthropology), long ago lost the interest of the academic departments related to the museums. With this, museums have not simply lost their most important allies within the university structures, but these one-time allies have turned into fierce competitors for scarce resources, and their appeal is strong because of the student credit hours they deliver and the cutting-edge research they produce.

Given this background, three interrelated questions arise: (1) How can we ensure continued support for the maintenance of university-based natural history museums, their collections and research associated with these collections? (2) How can we create opportunities for future growth and long-term vitality? (3) How can we overcome the see-saw cycles of crippling budget cuts followed by arduous rebuilding?

These questions assume, of course, that university-based natural history museums, and natural history museums in general, continue to be of intrinsic intellectual value and continue to be of value to society. Without examining this issue further, it is obvious that there is no compelling need for any university to have a natural history museum (indeed, many universities do not), nor for any particular museum to be part of a university. I am convinced, however, that the university context has the potential to make a unique, and highly valuable, contribution to the natural history museum enterprise (far more so than is generally realized), and that the museum, in turn, has the potential of making great contributions to the academic enterprise and the public service mission of universities (again, far more so than is generally realized).

It would be naïve to think that the difficulties university-based natural history museums are facing solely result from uninformed and uncaring, or perhaps even hostile, university administrators, and that they could be resolved simply by increasing political pressure on university decision makers. I believe that five broad sets of actions are necessary.³

1. Communication

For far too long, the value, and in some cases even the very existence, of vast natural history collections on university campuses has been a well-kept secret, known only to museum staff and a few chosen students who elected a curator as an academic advisor, and who were consequently led into collections-based research for their undergraduate honors thesis or their graduate work. While many university deans, vice-presidents and provosts were certainly dimly aware of the existence of these collections, they often did not enter the strategic radar screen of such administrators until the emergence of a crisis situation.

Once a crisis situation arises, it is not uncommon that academic administrators are accused of being ill-informed about the museological units under their control. All too easily, it is forgotten that the primary responsibility for educating the incessantly changing inhabitants of administrative offices about the value of museums to the larger academic enterprise lies with the museum community itself. It is absolutely critical that natural history museums, their leaders and their staffs communicate the existence, nature, scope, importance and use of their collections to the whole university community, particularly its leaders and decision makers. This communication has to be effective, continuous and consistent.

Fortunately, this communication is relatively easy. As experience has shown over and over again, the objects contained in the collections have the power to inspire endless fascination in not only unschooled laypersons, but also sophisticated academics. Each object is capable of telling dozens of captivating stories that link together the most diverse aspects of the human experience, each of which has potential academic interest. Because the objects in the collections are so powerful, the best communication by far is not only to talk about them but to make them visible and physically accessible.

2. Research

While far from the only goal of research in natural history museums, taxonomy and systematics traditionally have been the staple and foundation of collections-based research. Given how little we know about the physical world we live in—with only 10–15 percent of all living organisms taxonomically assessed—and global concerns over rapid losses of biodiversity, the pursuit of taxonomy and systematics continues to be of undiminished importance. Indeed, it is more important and urgent today than ever before. The importance of this component of the mission of natural history museums is stressed further by the fact that these institutions are currently essentially alone in pressing forward with this neglected, yet vitally essential, enterprise. Natural history museums bear a heavy responsibility that has been abandoned by others.

Recognizing this fact should impart a newfound sense of value to the scientific work we carry out in museums that is unaffected by the disinterest in taxonomy amongst our academic colleagues.

Recognizing the value and importance of taxonomic work does not mean that we can carry on business as usual. It has taken the scientific community 250 years to classify and describe only 10-15 percent of living things; we do not have 1000 years or more to classify the rest. We must retool the taxonomic enterprise and fully engage new methods, techniques and technologies to speed up the process vastly and disseminate information. Several international organizations have formed to promote and support these goals. Our museums need to become part of this emerging global effort and position themselves in it as key players.⁴

It is also clear that the gigantic amount of both manifest and latent information contained in our collections is relevant and pertinent to a vast range of interests in both basic and applied research, often topics and fields of great societal interest. To name just a few, our collections and the information they contain are of immense—though all too often unrealized—value for evolutionary studies, biodiversity assessments, conservation and restoration biology, pharmacological research, urban and regional planning, research on cultural and ethnic identity and the cultivation of ethnic heritage in our diverse society and many more. Stressing the importance of taxonomy (and, in anthropology, of material culture research) should not limit our research; on the contrary, we need to continue to connect taxonomy, as well as the vast range of data that can be extracted from our collections, with the full domain of contemporary science.

3. Collections Management

The vast collections held by natural history museums constitute at once a precious patrimony, a huge resource, a great obligation and an enormous burden. Unfortunately, policies, techniques and technologies to manage the ever-growing collections effectively and efficiently have been slow to evolve. For much of their history, our museums have considered collections the sole responsibility of individual curators who have established and exercised a culture of exclusive institutional territorial rights. This is no longer defensible. We must stop treating collections as sacred cows under the control of individuals and institutions and approach them as the public resources they are.

The first and most obvious step must be to provide much wider information access to the collections by electronically cataloging the holdings and linking the catalogues together into global data networks accessible through the World-Wide Web. Many institutions already have taken important steps in that direction, but much remains to be done.

Beyond information access lies a wide domain of collections management policies that needs to be reformed, but has, so far, barely been touched. We need to develop defensible and broadly-shared rationales for what we collect and why, and for what we do and do not need to keep. Too many specimens and lots in our collections take up valuable space and other resources only because we simply hate to dispose of them or because they increase the counts of our holdings, creating an inflated sense of the importance and rank of the collection. We also need to eliminate unnecessary duplication and competition between institutions and consolidate collecting activities as well as collections holdings within collaborative networks, giving institutions the opportunity to focus on particular biological groups or geographic areas. Such coordination alone has the potential to decrease costs significantly while strategically building on existing strengths, fostering networks and increasing the quality and efficiency of collections care and research.

4. Collections Use

The traditional tendency has been to restrict access to, and use of, collections in the interest of conservation (as well as the convenience of curators and collections managers). This conservative attitude has been detrimental to the interest of our institutions and, indirectly, to the well-being of the collections themselves. Rather than restricting access, curators and collection managers should seize every realistic opportunity to promote the use of collections in research, collegiate teaching, K-12 education, exhibits and public programs.

This does not mean that the demand for expanded access to collections must cause the abandoning of reasonable conservation concerns and sound conservation practice. Expanded use can be achieved while safeguarding the well-being of collections and individual objects, albeit probably at the cost of some additional effort and cost. Such effort and cost will be more than repaid, however, through the goodwill and support generated for the collections and the institution as a whole.

5. Building Constituencies

Despite much-vaunted ideals of academic collegiality, universities are deeply fractured organizations, divided by competing interests between academic units, polarized between principles of hierarchy and democracy in leadership and saddled with ever-increasing bureaucracies. University museums must build constituencies that reach across these and other fracture lines; they must engage administrators, faculty, students and staff. Fortunately, natural history museums are uniquely positioned to do so, because they potentially have something to offer to any campus group or constituency.

Equally important as internal constituencies, however, are constituencies outside the campus boundaries. Of all the things on a university campus, the natural history museum has the largest potential for popular appeal, with the possible exception of the football program. Because of this popular appeal, natural history museums can be the most effective portals between academic communities and the communities on which their support depends. In the fierce competition with K-12 education, social services, health care, internal and external security and other critically important causes for support from both the public and private sector, the academic enterprise is increasingly challenged to present a convincing case to the public. Natural history museums must seize this opportunity to prove themselves as vital assets to the university's efforts to explain the essence and importance of their work to society at large and, by doing so, build public support.

Conclusion

There are many signs that natural history museums in general are entering a period of great renewal and newfound vitality. Among them are the vast numbers of visitors attracted to newly opened museums, museum renovations and new natural history exhibits, the growing role our museums play in the educational process of K-12 students and the outstanding research in a wide range of fields and on a wide range of topics that is being done in our institutions. This reinvigoration goes hand-in-hand with an expanding public sense of a global threat to the biological and cultural infrastructure of our world and a growing interest in the conservation of both biological and cultural diversity, and an increasing disposition toward personal involvement in finding and creating a sustainable future. It is my belief that natural history museums are emerging as central resources and actors in this broad field of endeavor to mold the future through their collections, their research, their educational programs and their public services.

It would be most unfortunate if natural history museums were to start disappearing from universities at this critical moment. However, in the long term, the survival of natural history museums on university campuses and as integral parts of university systems can be assured only if universities can be convinced that natural history museums are not simply just useful and worthy institutions, but that they are making a vital contribution to the mission of the university. Ultimately, such value has to be demonstrated rather than asserted.

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Notes

¹ Consistent with general American usage, I include in the category of "natural history" museums and collections that cover the biological sciences, the earth sciences and anthropology/archaeology. Any one museum or collection may, of course, cover only a small portion of this broad scope.

² Reflecting my personal experience, I am addressing myself in this paper specifically to the situation of natural history museums and collections in universities and colleges in the United States of America. I suspect that a number of the trends and issues I identify also hold true for universities elsewhere in the world, particularly Canada and Europe, though I have to leave it to readers in those countries to judge whether, and to what degree, issues noted here apply to situations outside the U.S.

³ The suggestions below are in broad agreement with proposals made recently by Leonard Krishtalka in the journal *Museum News* (Krishtalka 2003).

⁴ See also Wheeler et al.

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“IN THEIR OWN IMAGE: GREEK-AUSTRALIANS” NATIONAL PROJECT—ENGAGING AND LINKING COMMUNITIES

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Abstract

“In Their Own Image: Greek-Australians” National Project was established 21 years ago by photographer Effy Alexakis and historian Leonard Janiszewski. We are researching and documenting the Greek-Australian historical and contemporary presence both nationally and internationally—resulting in books, research articles, multimedia displays, successful international touring exhibitions and a documentary for television. In 2001, the project became an associate of the Australian History Museum at Macquarie University. We provide lectures, photographic exhibitions and workshops both within the University and as an outreach activity, as well as maintain our ongoing research. That the Australian History Museum has incorporated our project within the University is both unique and significant. Projects dealing with ethnic groups have tended to be marginalized, but our current situation facilitates the mainstreaming of such research and recognition of the cultural and ethnic diversity and hybridism of Australia’s past. The project acts as a conduit between the Museum, the University and Greek-Australians, and engages the broader community through the activities arising from the research relationship. Our current research project, “‘American Beauties’ at the Niagara Café,” which will result in the production of a major book and touring exhibition, provides an excellent example of how such a relationship can provide previously untapped documentation and material to university museums and collections.

Introduction

Australia is often publicly applauded and characterized, nationally and internationally, as a prominent example of cultural diversity (referred to as “multiculturalism” in Australia—the recognition of both the maintenance and development of more than one culture within its social structure). The nation claims over 200 different ethnic origins. Over 20 percent of Australians were born overseas, and other than English, Italian is the most spoken language followed by Greek, Cantonese, Arabic and Vietnamese (Burn 2002).

Marginalization and Insufficient Engagement

National and state archives, libraries, museums—including university museums—and the grand narratives of Australia’s past, generally give little, or only token, recognition to the significance which cultural diversity and hybridism has had in developing the Australia of today. As a result, groups from non-English speaking backgrounds have been effectively alienated, marginalized and left broadly unacknowledged in the symbols and preminent events and developments of Australia’s history (L. Janiszewski & E. Alexakis *in litt.* 2003). Collecting and research institutions have been insufficiently engaged with ethnic communities, and overall have made only tentative attempts to understand what matters to these groups and their effects upon the broader canvas of Australia’s past. These institutions have not offered any practical support to researchers within the community sector who were attempting to obviate these failings. Moreover, when collecting bodies have directed their attentions towards these marginalized groups, their strategies are generally public relations

(publicity) campaigns, with limited outcomes following the high-profile launches and distribution of glossy pamphlets (Burn 2002). Significantly, budget allocations specifically assigned to the ongoing costs of preserving, cataloging and displaying any material collected from such campaigns appear to be undernourished when compared to the public relations campaign funds themselves, and dramatically more so when compared to those allocated to material of British-Australian origin held by the institutions.

The Antithesis

At Macquarie University in Sydney, the “In Their Own Image: Greek-Australians” National Project, working in association with the Australian History Museum and the Department of Modern History, is the antithesis of this situation. This bold and dynamic partnership is unique in its field of research and collection, firmly facilitating the obvious need to mainstream material from groups of non-English speaking backgrounds. The Project acts as an effective conduit between the Australian History Museum—with its associated scholars and students—and the Greek-Australian community. It also seeks to engage the broader Australian, and even international, community through outreach activities arising from this special relationship: collaborative touring exhibitions and museum displays; public lectures by prominent Greek-Australians; the development of teaching videos for both public and institutional use; and, potentially, a web-accessible database.

In Their Own Image

The "In Their Own Image: Greek-Australians" National Project was instigated in 1982 by Sydney-based documentary photographer Effy Alexakis. I, Leonard Janiszewski, joined her the following year as an historian of Australia's social and cultural past. Over the years, collaborative assistance has been provided by a constantly broadening network of colleagues in a variety of disciplines: sociology, social anthropology, demography, linguistics, social commentary, cultural activism, political theory, journalism, archiving, museum administration, art, writing, film-making and exhibition curating and design. Their input and guidance have been essential in our pursuit of the Project's aim "to provide a rounder, more complex and detailed, social, cultural and historical image of Greek-Australians, than any previously attempted" (Janiszewski & Alexakis 1989), and, in the process, to supplement the notable absence of collected material on the Greek-Australian experience, evident within museums and archival collections around the country.

The desired material was to be found in the homes of Greek-Australians, both within Australia and overseas,

Where family snapshots, letters, diaries, private official papers, memorabilia, and living memory lay awaiting a researcher's investigative interest. The well-known dictum of British historian Richard H. Tawney, that "historians need... stronger boots," was to be well evidenced by the magnitude of our task and our blistered feet. (Janiszewski & Alexakis 1989)

As suggested, the key to our subsequent success was personal contact. We went out and worked "with" and "among" our subject, the Greek-Australian community. Preconceived notions and stereotypes were cast aside as was the institutional attitude of engaging the community only through publicity campaigns and waiting for them to respond. Furthermore, as indicated by the Project's title, "In Their Own Image: Greek-Australians," we gathered material and stories which were of importance to our subjects.

Research Procedure

Initially, both the historical and contemporary presence of Greek settlement in Australia was geographically identified in each state and territory utilizing existing primary and secondary source material. Examples of the former are: Colonial and Australian census records, including a 1916 "secret census" of Greeks; early newspapers; police reports; government gazettes; significant documentary photographic collections; historical diaries and journals. The latter principally included historical and sociological research

articles, university theses and national and state listings of official Greek Orthodox communities and regional associations. Field trips were then made to locations identified as holding potential interviewees and research material. Such field trips are an ongoing necessity of the Project. A number of field trips also have been made to Greece, Cyprus and the United States. Given the weight of migration of Greeks to Australia from the first two countries, and the significant socio-cultural influence of Greeks migrating from America, it is not surprising that material on Greek-Australians was uncovered within these nations.

On-site research and oral history interviews follow strict methodological and documentation practices, including legal release for use in research, publication, electronic transmission and exhibition display.

Oral history interviews have consistently embraced broad thematic areas: life in country of origin; reasons for migration and settlement; initial settlement experiences; occupations; racism; family life; social activities; language problems; education; cultural identity; attitude toward host society; gender and generational differences; cultural maintenance; and considerations of re-migration. As oral histories, these are not quick grabs for possible sensational insights, but inquiries into the stated thematic elements across the breadth of an interviewee's experience. For those few individuals who preferred responding in written rather than oral form, questionnaires were supplied. Diversity of interviewees is considered essential within the Project, particularly regarding age, experiences, outlooks, occupations and period of migration or the number of generations removed from the original Greek forebear. We were conscious not to narrow our path but to cast our investigative net as far as we possibly could. All early interviews recorded on analogue tapes are undergoing digitization to ensure both preservation and compatibility with changing technology. Interviews have been conducted principally in English, with a small number in Greek. Detailed outlines of interviews are recorded in field notebooks and although some transcriptions of interviews have been completed, the task will continue long into the future.

All interviewees are photographed—and at times filmed—in their work, home or social environment. Their historical family photographs, private papers and memorabilia are sensitively selected, and then copied or donated, for inclusion in the Project's collection. The selection process includes an evaluation of an item's state of preservation, its historical, sociological or cultural significance within both a Greek-Australian and broader Australian community context, its common or rare status, its highlighting of the interviewee's story and whether it can be easily utilized for research and display. Identification details of all items are crosschecked through available sources, and the personal significance

of each one to its owner, or owners, is meticulously recorded.

All documentary information gathered is systematically placed in a database—an ongoing process—so that individuals and families, themes, particular types of items, photographic subjects, migration and settlement periods can be accessed, assessed and cross-referenced quickly for research purposes leading to publication or museum exhibition display. All physical items undergo preservation procedures and cataloguing.

Research Results

Over the past two decades, the Project has painstakingly gathered an extensive archive encompassing: recorded oral history interviews; historical (Fig. 1) and contemporary (Fig. 2) photographic and cinematographic material; private and official documents and published works; and memorabilia. The collection is owned by the Project's two instigators and is recognized as one of the most comprehensive

in Australia on a group from a non-English speaking background. Its resources have produced a number of national and international touring socio-cultural history exhibitions. The principal exhibition, bearing the same title as the Project, was developed in partnership with the State Library of New South Wales. Additionally, two major books, numerous published articles, conference papers and a documentary for television have also resulted.

A Working Partnership

In early 2001, when the project was invited to form a working partnership with the Australian History Museum and the Department of Modern History at Macquarie University, it brought with it a long and ongoing engagement with the Greek-Australian community, and a significant archive and extensive record of production in both exhibition and publication output. The union was certainly innovative. It not only placed a successful community-based project which focused upon a marginalized ethnic group within the



Fig. 1. Bill Florence (Vasilios Florias) being welcomed to Australia, Melbourne, Victoria 1922. Bill arrived in Melbourne as a young teenager from the Greek Ionian island of Ithaca. His arrival was part of the chain migration of his family to Australia. He entered the food catering industry in Victoria working in a number of "Greek cafés" before purchasing a shop, Quality Luncheon Service, in Melbourne's central business district. Marrying, and raising a family, Bill ran the business until 1969. He died in 1991, aged 84. Photo courtesy S. Raftopoulos & J. Florence, from the "In Their Own Image: Greek-Australians" National Project Archives, Macquarie University.



Fig. 2. Greek National Day celebrations on the steps of the Sydney Opera House, Sydney, New South Wales, Australia, 1984. On March 25 each year, Hellenic communities across the globe celebrate the blessing given on that day in 1821 by Metropolitan Germanos of Patras, for the Greeks to enter into conflict with the Turks in the hope of achieving their freedom. Photo: Effy Alexakis, from the "In Their Own Image: Greek-Australians" National Project Archives, Macquarie University.

critical scholarly environment of one of Australia's leading universities, but it placed it directly within the heart of the two bodies whose mission it was to research and collect material detailing Australia's past. This was something very new and challenging within the existing milieu of neglect characteristic of the collection of historical material from marginalized ethnic groups. With a wonderful link forged, the Project was now in a position to submit its material directly for broad scholarly examination and interpretation, teaching and museum display, as well as create new collaborative touring exhibitions, partnered publications and joint material collection.

Empowering Links and Potential Revelations

The relationship between the Project and its University partners has been empowering for the participants as well as the Greek-Australian community and the broader Australian public. Responses from many sections of Australia's Greek community clearly have revealed a sense of liberation through what they view as the start of their long awaited acceptance or inclusion into Australia's past within museum and

historical narratives. Greek language press discussions of the Project's placement within Macquarie University, unsolicited letters of support and personal phone calls from Greek-Australian individuals and representatives of regional groups and formal Hellenic organizations, all firmly augment the significance and importance of the union:

The Project's two managers...are now in a position to continue the digitizing and databasing essential for the maintenance and broader availability of their unique and comprehensive archive...to stimulate and nurture...the next generation of cultural and historical activists to ensure that the Hellenic historical and cultural presence in Australia can be used as both a unique and at times, often essential tool, through which Australia's development—since European settlement—can be viewed and interpreted. (Kyriakopoulos 2002)

Another report states:

Part of this task is the need to construct an image of Greek-Australian history as a legitimate perspective from which to observe and revise our understanding of the broader panorama and

concerns of Australia's last 200 years, rather than being content with its current limiting and demeaning research status as simply "ghetto or ethnic history"—a belittling which some historians and academics, both consciously and unconsciously, are unfortunately continuing to do in their work. (Diamadis 2002)

For Greek-Australians, the Project's partnership with Macquarie University has the potential to ensure that Greek-Australian voices and material culture—evidencing almost two centuries of a Hellenic presence in Australia—will not remain as limited curious anecdotes in museum displays or hidden among footnotes in historical publications.

For the broader Australian community, there is the potential recognition that by throwing such concentrated light upon the history of an ethnic community within a university museum and scholarly research context, the process will reveal the "cross-cultural transmissions and transformations" upon the development of mainstream Australian culture and history (Teo 2003). As has now been acknowledged, such a process previously could not occur:

If you were researching any cultural group outside British-Australians, documentation was very limited, archives hadn't collected anything and state institutions had only just begun [collecting] and that usually came from the middle class or well-to-do. (Stevenson 2001)

An Enterprising Lead

Such has been the effect of the Project within its new museum and academic environment, that its research, collection and interpretative methods are now being praised as exemplary templates through which the research and gathering of material from other groups of non-English speaking backgrounds can be engaged. This praise has been voiced both from within and without the University—by academics and cultural activists—and it seems that similar community-based projects may seek to develop links with other university museums and collections who wish to follow Macquarie's enterprising lead.

Current Research

Our current research project, "American Beauties' at the Niagara Café," provides an excellent example of how such a working relationship can provide previously untapped documentation and material to university museums and collections and what outreach activities can then be produced. The project looks at the Australian "Greek café" as a key element in the Americanization of Australian eating and social habits during the twentieth century. For the past two years, we have been taking oral history interviews (in English and Greek) with

those who operated, worked in and frequented these cafés, copying their historical images, photographing the interviewees, traveling to sites of Greek cafés to document what remains and acquiring café tableware, signs, menus, confectionery tins and boxes and printed café advertisements. Already we have traveled some 10,000 km. Because of these efforts, a display within the Australian History Museum is being mounted, lectures on the Greek café have been provided for the Department of Modern History, information and images are being entered into a database for accessibility to scholars and students and an internationally touring exhibition on the subject is to be designed and assembled. The exhibition will be produced in partnership between our Project, the Australian History Museum, a major New South Wales cultural institution, possibly the Power House Museum or the State Library of New South Wales and probably the Macquarie University Art Gallery. A companion book and education kit will accompany this show. Appropriate venues in the United States are currently being negotiated, including Ellis Island Immigration Museum in New York and the Smithsonian Institute in Washington, DC.

Engaging Communities

"Engaging communities" is at the heart of what the "In Their Own Image: Greek-Australians" National Project does. It engages and then cross-links the university community, the Greek-Australian community, the broader Australian community and even the international community. Because of this engagement, part of Australia's cultural diversity and hybridism is acquiring greater visibility within the museum and historical narrative context.

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THE SPIRIT CRYING FOR MEANING: UNIVERSITY NETWORK SUPPORT IN RESEARCH ENTERPRISE

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Abstract

Central Street Live was an innovative research-based exhibition in a campus gallery that was made possible through linking the working principles that govern Macquarie University in its core areas of business: Research, Teaching and Learning and Community Outreach. These connections enabled the project to develop a creative approach to the research and presentation of the overall project. As a result, the project allowed the State Art Gallery to identify and supplement a lacuna in their existing collection of Australian Art. This paper presents the development phases of a research-based exhibition. It shows that a University environment was necessary to complete and implement this research.

Introduction

The challenge of research is a requirement when working in a university museum environment. Yet, the shift of focus from object to viewer brought about by the “new museology” has created new work priorities and practices, particularly for university museums and collections, which already operate with limited human resources. As our work duties increasingly become more diversified, museum staff devote less time and resources to specialist areas of research.

However, commitment to allocating time for research is essential to our survival. Embarking upon an area of study that has been under-researched or ignored can, in fact, revitalize the museum’s existing exhibition program and/or establish the museum’s reputation as one that goes beyond the hype of blockbusters. For the university museums and collections in Australia, this is extremely relevant, as the public still views their existence at a distance. Furthermore, the problem remains that university museums are perceived as less accessible, less important and less interesting than national, state and regional museums.

In particular, the popularly accepted perception is that the national and state art museums are the only institutions that the public is passionate about and, further, have the resources to present major survey, retrospective exhibitions of various movements and/or individual artists in both historical and contemporary studies. In addition, a silent understanding still exists that the regional and university galleries operate on the fringe, ready to follow the center’s lead set by the national and state gallery museums. However, that is only a perception, and only when exhibitions such as *Central Street Live* gain media exposure and critical attention does the periphery emerge as a more interesting option. So, in many ways, it is exceptional when a university museum stages a major survey exhibition that challenges past historical interpretations to present a new and fresh perspective. This situation leaves a specific role for

UMAC to play in generating challenging exhibitions that contain a strong research component.

It was imperative for a large-scale exhibition such as *Central Street Live* to form a partnership with an institution that was willing to take risks. The appointment of an unknown curator using a revisionist approach to resurrect a period that had been disregarded by the mainstream curators and art historians as insignificant was both challenging and progressive. The university context was the ideal working environment from a curator’s perspective: it was outside the parameters and constraints imposed by state-run art museums and consequently could reevaluate relegation of the Central Street period to the curatorial basement by the major art institutions.

Partnerships

A partnership was considered between Macquarie University and The Lewers Bequest & Penrith Regional Gallery, a museum that recently had been refurbished through a huge government grant. With a new Lewers’ Gallery Director appointed, the *Central Street Live* project finally was approved. The project also was facilitated by the contract of an artist historian whose expertise in this field was invaluable, particularly through collection of visual and oral data.

The sharing of costs, intellectual discussions and viewpoints was stimulating and beneficial for both institutions, as was the sheer tenacity needed to complete the project on deadline. Within the university campus, collaborations were made between the history, photography and multimedia departments to broaden the scope and possibilities of the project, which enabled a creative and sustaining environment.

The support and interest expressed by colleagues provided the premise for discussion, debate and the exchange of ideas and information, which became an invaluable exercise into conceptualizing ways of seeing the exhibition develop.

Interdisciplinary

Working across the disciplines was vital to extend the parameters of historical and intellectual inquiry—where the notion of contextual and intangible material became more apparent—to enhance the compositional display. The intangible material collected and endorsed by the cross-referencing of various oral histories became just as significant as the careful selection of paintings for the exhibition. The blueprint for the spatial arrangements was made in advance, but the final arrival of all the works selected from both private and public collections brought together new and unforeseen relations. Working in a more flexible university environment allowed the blueprint to be modified, rather than it governing the spatial composition and thereby compromising the new and unexpected ideas.

The resulting installation defied the notion of arranging objects in terms of art history and categories. The objects and accompanying textual panels containing snapshots of contemporary artists gave a social and cultural dimension to the overall display. In addition, the posters, invitations and letters from that period provided the semiotics which delivered a direct link to the paintings, sculpture and installation pieces.

Often, art historical constructions dominate the themes of an exhibition at the expense of aesthetic dimensions. As the paintings were about color, the aesthetics were important. The arrangement was made through a collaborative process and gave careful consideration to color relationships. The results were captivating as viewers were shocked by the strong color effects and illusions created from the paintings within the space. *Central Street Live* represented a much brighter and dynamic past than we ever imagined.

Macquarie University encourages and supports professional development for its entire museum staff. The freedom and flexibility of our work practices provided the essential time needed to perform the consuming fieldwork of interviews and examining sites. The fieldwork, not library research, was the most challenging part within the curatorial process, but it became the vital methodology of disseminating new information in the Central Street narrative. The various intangible elements collated in the field determined the curatorial direction of the project that guided the visual display of the exhibition.

The Context of the Central Street Project

Central Street gallery was opened in 1966 and survived a short history until its closure in 1970 (Fig. 1). It left an indelible mark upon the entire art scene in Australia, as the gallery and its artists challenged the whole ethos of Australian painting by attacking the establishment that supported a nationalist agenda. The Central Street artists, well traveled, returned with

their international and therefore un-Australian ideas, attitudes and confidence. It heralded an era that would begin to compare the local with that of the international, producing a cosmopolitan forum.

Many informants from the Central Street days were contacted and informally interviewed. The results were astounding, as the time and distance of some forty years produced oral transmissions that refuted prior interpretations and revealed a more diversified approach by the artists than previously believed. This new evidence actually informed and guided the curatorial strategies and objectives. The oral information was used as evidence to support the theory that Central Street mixed American style with London attitude in an Australian context, thus disputing the previously believed notion that it was a pure form of American imperialism.

Australia's own brand of hard-edge paintings emerged—the movement was best understood as hybridization rather than blind conformity of dependency. As the reexamination of this period has demonstrated that the Central Street paintings are equivalent in stature and quality to their American and English counterparts, it now would be auspicious to make those comparisons extricating the differences and commonalities in the context of the sociopolitical climate of the late 1960s. It took a place like Central Street to bring the national versus international debate into the public arena. Central Street's existence thus had a major impact on the overall question of national identity. The artists' beliefs, practices and philosophies generally sought to create dissidence.

Why Central Street at Macquarie?

The Central Street project was highly appropriate in terms of both historical and contemporary perspectives within the university context. Like the Central Street Gallery itself, Macquarie University was born in the 1960s—and could not have emerged the way it did in any other era. It was established specifically as a radical and innovative experiment, consciously different from the older Australian universities. Along with other 1960s universities emerging around the world, it nurtured an interdisciplinary culture.

These connections made Macquarie the most appropriate place for research of this nature, as Central Street also questioned the parochial attitudes and culture of the time. The university context nurtures and provides firm support for active research in the museum field that will attract and sustain new audiences. Scholarship can embrace wide-ranging exploration of the way research can constantly reinvent and produce new and challenging displays contributing to the museum's annual programming. Stimulating and changing exhibitions, rather than fixed and permanent displays that can often render the university museum irrelevant to outreach, can

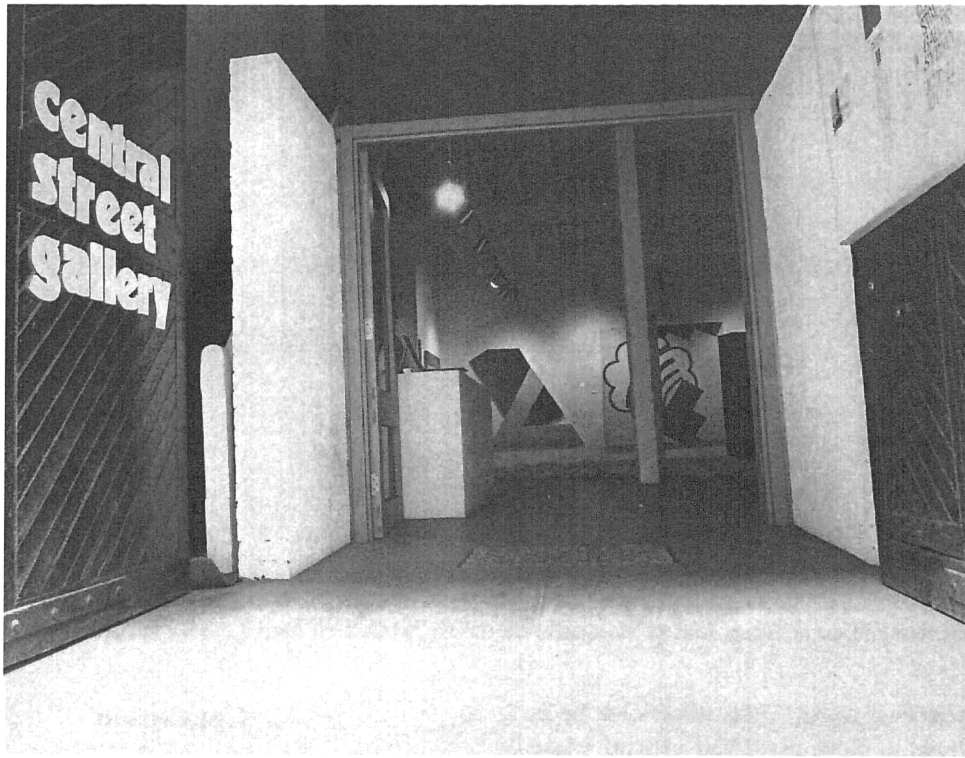


Fig. 1. Central Street Gallery Sydney (downstairs) Group Exhibition—Paintings and Sculpture, November 12-29, 1969. Photograph by Mike Dangar.

indeed measure the success of that museum in attracting new audiences.

Narratives

The incorporation of micro narratives within the overall exhibition development produced a display that moved the viewer to construct personal links between the objects on display. The intangible elements gathered during fieldwork—such as attitudes, language, beliefs and stories of the time that were not part of official history—contributed significantly to the overall installation: they permitted the development of interesting organic, spatial and contextual connections. These display methodologies broadened the notion of intangible heritage in both the arts and humanities.

Macro Narrative

The artist Tony McGillick played a leading role in the macro narrative structure informing the conceptual development of the exhibition. For most people, Central Street was reactionary. However, informants revealed a different dimension to this previously espoused assumption, demonstrating that the site caused conflict between rival art groups, and that its artists were more progressive than commonly believed. McGillick's intriguing information lead to a search which uncovered previously unknown and unpublished letters that McGillick wrote in 1965. This was a major breakthrough for the direction of the project. The letters became the

focus of the curator's catalogue essay which identified Tony McGillick, for the first time, as a political cult figure of the 1960s. Through careful reading of the letters, and many interviews with those who knew him well, his character emerged and set the pace for the exhibition. The letters gave shape to the structure of the exhibition and revealed the collective memory of a young group of artists whose experiences of the London scene represented a formative period in their development.¹ They transmitted to the Sydney scene acumen in the cultural and political landscape within the Australian context in a subtle yet powerful way:

Henneky's [in London] was the scene. That grouping together was really invaluable to all of us. It was a practical education—one was practicing art among young artists. And we were bombarded with impressions from all over the world. (qtd. in Davis 2002)

The Audience

The pioneer artist of Australian psychedelia, Vernon Trewicke, who had been formally neglected by art historians and institutions, resurfaced as a result of the Central Street project. Trewicke's original 1967 psychedelic exhibition room from the Central Street Gallery was recreated. The room contained three-dimensional paintings sourced from that period. The darkened room was illuminated with blue lights. The sounds of Ravi Shankar's music echoed throughout the room, recreating the 1967 space which was referred



Fig. 2. Installation view of *Central Street Live* at Macquarie University Art Gallery, March 7–May 5, 2003. Photograph by Effy Alexakis.

to as the “psychedelic cellar.” The ultraviolet lights caused the paintings to glow, move and expand, which heightened visitor interaction with the 3D paintings. As early as 1969, the esteemed Australian critic and historian Daniel Thomas made the insightful comment that the work of Treweeke was “the only psychedelic art being done on a serious level in Australia.” Yet, his works did not generate further critical attention until the beginning of the next century.

This was an active component of the exhibition, where visitors felt the drama and atmosphere of the sixties and were issued 3D glasses to view works, which also enhanced their experience. The room proved to be a major attraction for both adults and children.

Beneficial to the whole process was the strong educational component contained within the exhibition, which informed and encouraged adults and youths to ask questions and exchange ideas in a self-guided fashion. Reminiscence recaptured the sixties in its fashion and music with the urgency of the protest era activating the space (Fig. 2).

Lasting Effects

A survey exhibition devoted to Treweeke was later staged at the Penrith Regional Gallery in 2003. It received significant television, radio and print media coverage. And for late 2004, the work of Ian Milliss—yet another ignored artist of the period—will be staged at Macquarie University as an extension to the continuing research into *Central Street* and its aftermath. His career in early conceptual practice and left-wing politics will be highlighted in this exhibition. The show is currently in its developmental stage.

Conclusion

Such was the success of the *Central Street Live* exhibition that it established a significant profile for Macquarie University Art Gallery. Essentially, it motivated serious recognition by the arts community toward the Gallery as a critically proactive collecting institution for the period of the 1960s. *Central Street Live* confirmed that university museums are in a unique position to undertake research-based exhibitions that will actually instigate and encourage debate. After all, the university environment is about inciting differing opinions and the museum space can act as a center for debate and questioning of issues pertinent to our culture and society. This, of course, was what *Central Street* was all about.

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Notes

¹ Select segments of the collected letters have been published in the *Central Street Live* catalogue. See Davis for more information.

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DISTANT LIVES & DIGITAL SURROGATES: HISTORICAL RESEARCH, ELECTRONIC PUBLISHING & COLLABORATIVE PARTNERSHIPS IN AN AUSTRALIAN UNIVERSITY MUSEUM

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Abstract

Innovation, outreach and collaboration in university museums can take many forms. In recent years, virtual access through web sites and electronic publishing has helped to transform university museums into dynamic spaces for teaching, research and community outreach. The Lachlan Macquarie Room, located inside Macquarie University Library in Sydney, is a unique heritage museum containing the original timber panelling and fittings from the Scotland home of the University's namesake, Lachlan Macquarie. Since 1995, public use and awareness of The Lachlan Macquarie Room, and its related display items, has been expanded through the development of dedicated web sites, public exhibitions and seminars examining the life and times of Lachlan Macquarie in Britain, North America, Asia, the Middle East and Australia. This paper examines how curatorial staff at Macquarie University are exploiting web-based technologies to provide 24-hour access to the museum and describes the initiatives under development to establish national and international research partnerships to promote the history of this unique historical collection.

Introduction

At the entrance to Sydney Harbour stands the Macquarie Lighthouse. Originally built between 1816-1818 to guide ships to anchorage at Sydney Cove, the lighthouse was an important physical and emotional beacon for sailors and their passengers reaching Australia. It marked the safe conclusion of the long voyage and the beginning of a new world of experiences in a strange and exciting new continent.¹ Approximately one hundred and fifty years later, this lighthouse became the symbol for the official arms of the newly-established Macquarie University. The consequences of this decision have been significant; it has provided a unique context for engagement within Macquarie University and in the wider community beyond the perimeter of the university campus.

Macquarie University, Sydney, was founded in 1964 and opened for teaching in 1967.² Thirty-five years later, the institution has become a key participant in both the Australian tertiary sector and the international research network, with a tripartite strategic mission (and statutory obligation) to foster teaching, promote learning and establish community links. As such, the University is uniquely endowed with commemorative links to its Scottish namesake, Lachlan Macquarie, who governed the convict colony of New South Wales from 1 January 1810 until 30 November 1821.³ His governorship was a period of autocratic penal rule tempered by benevolent paternalism. Macquarie initiated an ambitious program of public works, the establishment of educational and social welfare initiatives, and the foundation of organized commerce, banking and trade. The challenges of a rapidly expanding convict population and the pressure for democratic and judicial reforms from resident free settlers was counterpoised by major

advances in the geographical discovery and exploration of the eastern coast of Australia. Macquarie helped to transform a distant penal settlement, and an outpost of British imperial ambition, into a thriving commercial entrepot—with trading links to China, India, South Africa, Britain and the Americas.

In 1967, Macquarie University received a unique gift from Scotland—the complete timber interior (walls, doors, windows, shutters and fireplace) of Macquarie's original parlour room from inside his house on the Isle of Mull. This parlour is a room approximately 20ft x 11ft (6m x 3.5m) in size, with a ceiling height of 8ft 6in (2.5m). The room was reassembled eventually and installed within the University Library in 1978-1979 as a commemorative heritage space now known as "The Lachlan Macquarie Room."

Heritage Place

Historic House Museums are found extensively throughout the world. They come in many shapes and sizes and often act as significant cultural agencies in the preservation of national, regional and local heritage.⁴

At their worst, these buildings may appear to be "three-dimensional autobiographies" commemorating the lives of rich or famous "dead white males." At their best, house museums can convert dusty, aging dwelling places into sites of relevance and meaning for a diverse range of people and interests. The social history of a historic house, with its furnishings and surrounding grounds, can often lead to wider stories of gender, class and race. In particular, such houses can become windows of opportunity for scholarly research and community outreach.

After only 200 years, historic houses in Australia have brief architectural traditions when compared

with heritage buildings in Britain, Europe and North America. The spread of white settlement across this continent was constrained by geographic isolation, economic opportunism, regional rivalries and climatic extremes—and the surviving heritage buildings tend to commemorate the activities of colonial governments rather than those of private individuals. By contrast, indigenous Australians have lived on the island for at least 40,000 years, but have not left any durable erected monuments. Their legacy and culture is encoded and preserved in their remarkable rock art, creation myths and oral traditions.

Consequently, The Lachlan Macquarie Room at Macquarie University is a strange amalgam of displaced architectural traditions and historical interpretations. From the outset, it has been an “inner space” seeking a wider heritage context.

Yet, although public access is limited by location and staffing restrictions, the Room is rich in personal connection. One of the historical ironies of this Room is that its shape and appearance commemorate the achievements of Macquarie’s wife, Elizabeth,⁵ not the man himself. She refurbished the room in the months of May and June 1824 as a “homecoming surprise” for her husband, who was absent on business in London. However, Macquarie died there without ever seeing her efforts or the extra rooms that she had added to their house. She brought his coffin back to the Isle of Mull, Scotland, and held his memorial service in one of the recently-constructed ground floor rooms. Elizabeth Macquarie buried his remains in the family burial ground approximately 300 yards (274m) from the house, and eleven years later she would join her husband.⁶

Not only does the Lachlan Macquarie Room recreate the original dimensions and ambience of the original parlour room, but it also contains several unique items that belonged to the Macquaries: a dining chair, dinner platter, book of poems, a seventeenth century map of Mull, a replica of the regimental colours of the 73rd Regiment of Foot and a nineteenth-century engraving of the Macquarie lighthouse at South Head, Sydney. All these items form part of the permanent public display adjoining the Lachlan Macquarie Room inside the University Library building.

Virtual Space

As early as 1995, Macquarie University Library was embracing the use of the World Wide Web as a means of promoting the existence and history of Lachlan Macquarie’s original parlour room located on campus. Remote access via the Internet to heritage spaces and unique museum objects was seen as an ideal way of describing the history of this “space” and establishing broader links with the community.

The success and popularity of the Lachlan Macquarie Room web site⁷ led to the establishment of

a joint initiative with the State Library of NSW in 1997. Its purpose was to prepare an online collection of full-text transcripts of the original journal entries of the Macquaries in Australia in the period 1809-1822 (with associated historical notes/links).⁸ This public web site, known as *Journeys in Time 1809-1822*, provided the first electronic access to the original writings of the Macquaries.⁹ It also provided a mechanism for scholarly discussion and critical comment.

The recognition of the value of cyberspace and its ability to facilitate the publication and distribution of scholarly findings has led to the creation of two other web sites at Macquarie University Library. These document other aspects of Macquarie’s life in India and Sri Lanka.

In 1999, the Library made available *Seringapatam 1799*, which provides full-text transcripts of Macquarie’s account of the British military campaign in southern India in 1799.¹⁰ Then, in 2003, this was supplemented by the web site entitled *Under A Tropical Sun*, which transcribes Macquarie’s letters and journals describing his experiences in Ceylon in 1796.¹¹

These electronic initiatives are seen as an integral part in the development and promotion of the Lachlan Macquarie Room as a scholarly resource and teaching space at the University. In addition, they allow for the establishment of an outreach program that opens the University to wider community interaction and participation.¹²

Scholarly Context

Biographical research and textual analysis of personal diaries and correspondence is a complex and demanding area of scholarly activity. In July 2001, The National Library of Australia enunciated a broad statement of intent in relation to the preservation of the cultural and historical materials recording the history of the nation. Similarly, the State Library of NSW has initiated a broad program of cultural and scholarly activities in the decade leading up to 2009 and the celebrations commemorating the establishment of the Mitchell Library.¹³

Macquarie University Library has been systematically developing its collection to enhance scholarly access to research materials that describe, analyse and illuminate the period of the late eighteenth and early nineteenth centuries—particularly the clash of empires and polities in Europe, North America and Asia that form the backdrop to Lachlan Macquarie’s life. Library funding has been committed to the purchase of manuscript and newspaper sources on microfilm, as well as a wide cross-section of print and out-of-print materials.

Collaboration

Technological innovation continues to provide new directions for librarians, archivists, curators and custodians of cultural heritage objects. A recent example of this type of international cooperation in a digital context is the TANAP Project involving museums, archival repositories, libraries and universities documenting the history and impact of the Dutch East India Company (VOC) in Asia, Africa and Europe between 1602-1796.¹⁴ These records are the most complete and extensive source on early modern world history anywhere. Such initiatives provide important templates for future cooperation between cultural institutions.

The substantive parts of Macquarie's personal writings are held by the Mitchell Library (State Library of NSW, Sydney) and State Records (NSW). For this reason, Macquarie University and these two institutions established a joint partnership in 2003 to create "The Lachlan & Elizabeth Macquarie Archive" (LEMA). The goal is to provide enhanced scholarly access to relevant transcripts, digital reproductions, indexes and historical notes relating to the Macquaries. This will provide a window of opportunity for Macquarie University to become a major initiator in the preparation and provision of electronic text transcriptions of original Macquarie source materials held in Australia, the United Kingdom and elsewhere.¹⁵

The long-term objective is to ensure that by the year 2010 there will be an acknowledged digital resource for researchers to consult and utilize. This year will mark the commencement of a unique series of bicentennial celebrations relating to Lachlan Macquarie's governorship in Australia. Already a wide range of public bodies and historical societies, as well as various government agencies, cultural institutions, companies and corporate organizations, have indicated an interest in developing a public program of events and commemorative activities.

Conclusion

If there is cultural resonance in the twenty-first century mind for the lives of a Scottish soldier and his wife, it raises the possibility of going beyond what at first glance appears to be a small and limited museum space such as The Lachlan Macquarie Room at Macquarie University Library. In traditional terms, this is a heritage area and a collection of objects that hardly merits attention—and yet in the digital era, it can be transformed from an "inner space" into a dynamic "teaching place."

The Lachlan Macquarie Room is more than simply a remembrance and memento of individuals from the early nineteenth century; it is an opportunity to create a unique historic record within a digital framework.

Preservation can take many forms, and the distributed scholarly environment offered by electronic publishing may be a new frontier for museum curators and researchers to explore. It can become a place where they bring their own special talents and skills to the forefront of teaching and research.

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Notes

¹ Construction of the Macquarie lighthouse at South Head commenced in 1816 based upon the design prepared by noted convict architect, Francis Greenway. The lantern became operational in 1818. For a detailed history, see Bridges. For the social significance of the lighthouse, see Faro.

² For a discussion of the history of the establishment and naming of Macquarie University, see Mansfield and Hutchinson and Macmillan.

³ For biographical and historical details regarding Lachlan Macquarie, consult Ritchie, Broadbent and Hughes, Ellis and Currie.

⁴ See Donnelly.

⁵ The only biographical study of Elizabeth Macquarie that has been published to date is Cohen's *Elizabeth Macquarie, her life and times*. Brief entries about her also can be found in Pike's *Australian Dictionary of Biography, Vol 2* and Kerr's *The Dictionary of Australian Artists; Painters, Sketchers, Photographers and Engravers to 1870*.

⁶ The Macquarie Mausoleum on the Isle of Mull was gifted to the people of New South Wales on 6 October 1948 by Mrs Pamela Pelham (6th Countess of Yarborough), the owner of the "Jarvisfield" estate (1948-49), through an Australian Trust consisting of the Union Trustee Co. of Australia and the Royal Australian Historical Society (and later transferred to the National Trust of Australia [NSW]). The mausoleum currently is maintained on its behalf by the National Trust for Scotland.

⁷ See *The Lachlan Macquarie Room*.

⁸ The collection is accessible through the *Journeys in Time 1809-1822: the journals of Lachlan & Elizabeth Macquarie* web site.

⁹ See Walsh. *Journeys In Time 1809-1822* also extended the coverage originally provided in the 1956 book *Lachlan Macquarie, Governor of New South Wales: Journals of his Tours in New South Wales and Van Diemen's Land 1810-1822* by including additional transcripts for the Macquaries' voyages to and from Australia in 1809 and 1822.

¹⁰ Lachlan Macquarie recorded his experiences fighting against Tipu Sultan, the ruler of Mysore, and, in particular, the assault upon Tipu's fortress at Seringapatam. The campaign transcripts may be accessed through the *Seringapatam 1799* web site.

¹¹ *Under A Tropical Sun 1796-1821* details Lachlan Macquarie experiences in Sri Lanka in 1796, as well as later historical links between colonial NSW and Ceylon 1814-1821.

¹² Other outstanding examples of web site projects established to promote historical research and electronic publishing include *Valley of the Shadow: Two Communities in the American Civil War*, *The William Blake Archive*, *American Memory*, *Electronic Beowulf* and *The Tiger and the Thistle: Tipu Sultan and the Scots in India*.

¹³ The State Library of NSW has already developed a number of important digital archiving projects, including *The Papers of Sir Joseph Banks* and *The Matthew Flinders Collection*.

¹⁴ See *TANAP: Towards A New Age of Partnership. A Dutch - Asian - South African Heritage Programme*.

¹⁵ There are additional, and important, holdings to be found within Australia at the National Library of Australia and the Tasmanian Art Gallery & Museum. Overseas, there are documents held in the National Library of Scotland, the Scottish National Archives, the National War Museum of Scotland (Edinburgh Castle), the India Office Library, the Public Record Office (in London), as well as related holdings in India, Sri Lanka, South Africa and possibly in Canada and the United States.

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LINKING MUSEUMS AND LIBRARIES: SUBJECT ACCESS THROUGH MUSEUM OBJECTS

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Abstract

Access to information about museum collections is especially important in university museums because of the academic nature of their missions. This paper proposes the use of a ubiquitous tool to provide an additional access point to information about museum collections: the Library of Congress Subject Headings (LCSH). Integrating museum objects with the library's monograph collections gives users access to great amounts of potentially relevant information. I have examined a case study conducted at the Spurlock Museum at the University of Illinois Urbana-Champaign, in which LCSH were attached to object records in the museum's database. It was found that LCSH were not efficient tools for the project, therefore, I have examined the possibility of a new tool to do the same work: the LC Class Web.

Introduction

The Spurlock Museum at the University of Illinois has recently opened a new facility after having been temporarily housed in attics and basements, broom-closets and barns for nearly a century. Its collection of 50,000 objects is diverse, holding ethnographic and archaeological collections from across time and around the world.

One of the most resounding requests facing front-of-house staff since the museum opened in September 2002 is for more information on specific artifacts. However, because the museum only recently has acquired a professional staff and has had, in the past, a very catholic collecting strategy, information about items is often not readily available or it is organized inconsistently, if it is known at all.

I began examining how visitor queries could be answered by sending interested parties to the library to find the information on their own. By linking Library of Congress Subject Headings (LCSH), this project is intended to facilitate library use by museum audiences, enabling interested parties to incorporate material culture items into traditional research and hopefully include the museum in the process.

This paper discusses a case study in which the artifacts in a gallery at the Spurlock Museum at the University of Illinois are given LCSH access points. The LCSH enable the artifacts to interact with the University Library system, and they provide researchers with a resource for more information about the objects in the Museum's collection.

Why LCSH?

Libraries have been very adept at adopting standards for the classification and cataloguing of books. These standards, often adopted internationally, allow the great deal of variation present in libraries and their holdings. The Library of Congress has developed a cataloguing system that supports flexible collecting for

vastly different institutions. LCSH allow researching at the patron's level through authority-based subject searching.

In this project, I do not propose that museum objects be catalogued using library standards. Although it has been shown that library organizational schemes can work for museum cataloguing, registrars are often reluctant to adopt them (Beirbaum 1990). I am proposing that LCSH be linked to objects through the object database in order for museum objects to give access into library catalogues.

The library is one of the most used tools on campus. There can be little excuse for students who do not know how to use the library and do not do so regularly. By using traditional library tools for the integration of material culture into traditional academic research, we hopefully can encourage more researchers to use objects in their research. As students enter universities having used computers for the entirety of their education, they often demand that information be available to them immediately. This is true for information about the objects in museums.

By offering a point of entry into the library, we perhaps can encourage researchers to look beyond the limited knowledge and bibliographic information about collections like the Spurlock Museum's. This lack of information, a result of years of understaffing and neglect of the collections catalogue, can be redressed if we can provide ready access to information and thus facilitate active research by people outside the museum.

The primary impetus for this project is the Spurlock Museum's lack of an active research program. There is neither staff dedicated to researching collections or encouraged accessibility for external research. If the Museum is to distinguish itself as a University Museum (as opposed to a museum at/in a university), a research program must be created. If this project can facilitate integration of the Museum's collections into undergraduate research, we can get quality research

about our collections to contribute to our knowledge base.

I feel that it is key to focus our energies on facilitating undergraduate materials-based research. If we can convince the next generation of scholars, policy makers and general public that university museums provide access to objects that are necessary for basic research, then the community may be sufficiently engaged to protect the university museum from obscurity.

Linking the Spurlock Museum's objects to the monographs in the Library directly benefits the campus community in many ways. Current University budget restrictions encourage innovative cross-campus collaborations like this one. Although in the past museums and libraries have often worked quite closely at the UIUC, this collaboration has been traditionally hard-pressed. There is a benefit to the Library, as this may encourage library usage by those students who may be otherwise remiss to use the library. It also provides a link to museums for libraries increasingly engaged in interpretive programs that traditionally have been in the realm of museums.

To the Spurlock Museum's further advantage, we can provide research resources without maintaining a separate library within the Museum. By relying on the University Library, we do not have to hire a librarian to maintain a library on site. The library's 10 million volumes are ample to cover our required knowledge base.

Main Section

This study had two distinct objectives: to determine the feasibility of adding LCSH to 50,000 object records and to determine the usefulness of the outcomes. It seemed obvious from the outset that it would take time to add these data to the object records, but I wanted to explore what the true cost of such a project would be and whether the benefits would make it worth doing (and whether, perhaps, the project might attract external funding).

The first step in the study was to familiarize myself with the current cataloguing and classification literature. Once a solid understanding was gained of how cataloguing works, I had to evaluate how objects are viewed.

This study originated with the idea to add some LC Subject Headings to our existing object records, which would enable users to identify relevant topics in the library catalogue. We encountered three main issues to resolve.

1. From what perspectives will users look at objects?
2. How broad of an entry into the library do we want?

3. Do LC Subject headings offer enough breadth?

We soon realized that researchers would be looking at objects in multiple ways. For example, this artillery shell (Fig. 1) could be looked at as an example of artillery shells or as representative of modern armament and warfare. It also could be examined in provenance research or in regard to its donor. Materials and manufacturing could also be the focus of the research of this item. Our solution for this problem was to determine 10 ways in which people could examine and research an item (called genres) and to offer terms for corresponding subject searching.

Concepts to be covered by LCSH in database:

1. Geographical location from which item came
2. About period in which item was made/used
3. About item type
4. About culture
5. Material
6. Technology to make
7. About donor
8. History of item or item type
9. Maker
10. Provenance

After determining the data structure, it was necessary to modify the museum object database and to begin assembling the Subject Headings.

LC Subject Headings are arranged hierarchically. The more terms are added, the more specific the heading becomes. If we take our artillery shell as an example and use the LC Subject Heading "Artillery," we receive 271 entries from the University of Illinois Library and 21 from the local Urbana Free Library. If we focus the term to "Artillery—Usage—World War—1914–1918," we get one entry from the University library and none from Urbana Free. Educators and Librarians often prefer a search with many results. This broad source matrix offers students a way to structure their arguments and a larger pool from which to draw their research.

The major problem with LCSH is that one term, while it may be related to other terms, does not

1900.83.0023A, World War I Artillery Shell

- Geography: Europe -- West
- Period: World War -- 1914-1918
- Item: Artillery
- Culture:
- Material: Metal -- Brass/Steel
- Technology: Armaments -- Manufacture
- Donor: Armed Forces -- Ambulatory Services
- History: Artillery -- History
- Maker:
- Provenance:



Fig. 1. Photograph by kind permission of the Spurlock Museum.

necessarily link to it. For example, someone searching for the term "artillery" may also be interested in the terms "armament," "warfare," "cannon," "projectile" and many other terms. This presents a problem with the current Library catalogue, as only one Subject Heading can be searched for at a time. Therefore, we can add only one Subject Heading per category per object. This is wholly inadequate in the way that Subject Headings are structured. Often, more than one term would be appropriate for the same concept. Furthermore, LCSH are not compatible with the Dewey Decimal Classification system (another widely used library tool, particularly in primary school libraries).

Results and Concluding Remarks

I found that it took a lot of knowledge of both LCSH and the collections—a combination that no one currently has in the Spurlock museum—to correlate the two. As such, it took nearly 45 minutes per item to add the Subject Headings to the object files. This resulted in a total time of 45 labor-hours for the 60 items surveyed. While this is excessive, it should be noted that, because of similarity in collections, some of the Subject Headings used for these items can be expanded to roughly 15,000 items. For example, our artillery shell shares its headings with the other 12 shells from that same accession group. It shares the time period headings with the 227 items in the collection from WWI. Similarly, our Roman fibula shares its culture and time period subject headings with 1643 items in our collection.

Although these incidental connections would decrease the overall time for adding LCSH to the entire collection (with at least a few SH for each item), the problems with the system remain. These incidental connections may prove to be just as useful if using another system.

Despite the benefits that this linkage of objects to the library potentially could provide, the time/cost requirements of enacting this linkage and the inherent failures of LCSH mean that this project cannot progress out of concept stages. It simply will cost too much to add LCSH to the collection of the Spurlock Museum. However, in the progress of this project, another, perhaps more appropriate, system was discovered.

One theme throughout this conference has been for university museums to gain relevance to the university community as a whole. I think that this kind of linkage could be used as a tool to gain relevance by allying the museum with a proven university mainstay, the university library. Also, by adding a library-based component to museum objects, we are training students to use material culture in their studies, and promoting hands-on training. Including students in research and staffing plans furthers the training of our future colleagues and those who will carry our profession through this century.

I have begun looking at a tool that the Library of Congress is currently assembling: Class Web. This tool will enable users to search for a subject heading and find the classification schedule in which that subject heading is most often found. The system will provide up to 10 closely related subject headings that are also found in the corresponding classification schedule (with similar classification numbers). This will allow users to find terms related to the term they have in mind through the classification number. This also enables easy access to libraries equipped with the DDC system, because LCC can be related to DDC.

The Class Web's syndectic data structure potentially can provide horizontal, multi-tier access to information. However, the system is still in testing phases and still requires a point of entry. I am currently working with Professor Emerita Pauline Cochrane of the University of Illinois and her doctoral classification class to try to find ways in which that first step can be made into the class web system. I then may examine if the system is useful.

This system requires consistent metadata in the museum object files. Location, culture, name and other data should come from established thesauri and authorities. If consistent data are used in the classification of museum objects, it then may be possible to map these data into the class web system mechanically, providing usable results. Otherwise, the process remains a manual one and the time/cost component may become prohibitive again.

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UMAC WORLDWIDE DATABASE

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Abstract

A web-based database has been developed in support of UMAC's mission. The database aims at providing a global directory of university museums and collections to be used by UMAC, researchers, students and the general public worldwide. The advantage of the system is that museum professionals from all over the world are able to enter data and keep it up to date. At present, the database can be browsed by geographical index, type or subject. An additional "Search" allows a full-text search. Further development of the database is planned.

Introduction

A web-based database in English has been developed for UMAC.¹ The UMAC Worldwide Database aims at providing a global directory of university museums and collections for UMAC, researchers, students and the general public worldwide. The advantage of the system is that museum professionals throughout the world will be able to enter data and keep it up to date.

The database incorporates two major existing databases of university museums and collections: UMAC/Macquarie Database, developed by Peter Stanbury, and the database of German universities and collections, developed by Cornelia Weber.

Public Access

The database offers two different interfaces: one for public access (to obtain information) and another for data entry. From the index page, one can browse the database by geographical area, type or subject. Subcategories under the three main classifications indicate the number of records available for a particular keyword. Clicking on a specific geographical area, type or subject shows the list of corresponding records, ordered geographically (Fig. 1). An additional "Quick Search" allows a full-text search. This can be used, for example, to find the collections of a specific university.

1. Geographical Index

The geographical index shows the location of a specific museum or collection. Four categories differentiate museums and collections:

- Continent
- Country or Territory
- State or Province (where applicable)
- City

2. Index by Type

The index by type provides an overview of different types of institutions. If necessary, a new type may be

added at any time. Presently, the database differentiates 18 types:

- Aquarium
- Arboretum
- Archive
- Art Gallery
- Astronomical Observatory
- Biological Station
- Botanic Garden
- Collection
- Greenhouse
- Herbarium
- House Museum
- Memorial
- Museum
- Other
- Planetarium
- Science Centre
- Sculpture Park
- Virtual collection/museum

3. Index by Subject

The index by subject shows the academic disciplines represented in the collections or museums. The database currently distinguishes 99 subjects, including archeology, biology, chemistry, history of technology, numismatics and university history, among others (Fig. 2). Subjects such as natural history, biology, botany and phylogeny may overlap. The next step is to revise the subjects into a hierarchical structure (thesaurus) with the help of the working group "directories." As the subject hierarchy becomes more specific, users will be able to obtain increasingly precise results.

4. Index by Object

As soon as possible, an index by object also should be set up. Developing such an index is a major challenge and a unique chance for UMAC to make an important contribution to the worlds of science and the humanities, and museology in particular. This index should classify all objects in university collections and museums through similarity and hierarchy. For example: artifact – model – wax model.

UMAC Worldwide Database of University Museums And Collections (under construction)

Compiled by members of the ICOM committee UMAC (University Museums and Collections)
 Project Chair: Dr. Cornelia Weber Team: Marta C. Lourenco, Bernard Van den Driessche, Martin Stricker (technical administration)

Index | Cornelia Weber | New Record - Account - Logout

Quick Search: Search

Editor: Bernard Van den Driessche - Edit This Record - Status: open open Update

Catholic University of Louvain, Louvain-la-Neuve, Brabant wallon, Belgium, Europe

Musée de Louvain-la-Neuve
 Museum of Louvain-la-Neuve

Type: Museum Subject: Archaeology, Art, Art History, Ethnology

Address:
 Place Blaise Pascal, 1 B.1348 Louvain-la-Neuve

Opening Hours:
 Mo-Fri : 10-18
 Sun : 14-18
 Closed : Saturday and holidays (Saturday and Sunday in July and August)

Contact:
 Van den Driessche Bernard
 acc@muse.ud.ac.be
 vdd@muse.ud.ac.be
 Phone: +32/(0)10474841
 Fax: +32/(0)10472413

Additional Information:
 Entry : 1,25 Euros. Students : free entrance.

Description:
 The museum of Louvain-la-Neuve was inaugurated in 1979. The collections (originally cast reproductions started in 1864) includes today Fine art (sculptures, paintings -ancient and contemporary-, prints), Archaeology (most mediterranean) and Ethnography.

A new building (4.000 square meters) will be erected in the city center in front of the new Aula Magna.

Further Reading:
 See web-page: <http://www.muse.ud.ac.be/Musee/Publications.html>

Internal Notes:
 Other web reference : <http://www.lesmuseeswallonie.be/html/musee.php?id=194>

Update Reset

Current list: Index of "Archaeology" (69 records) Musée de Louvain-la-Neuve, Louvain-la-Neuve Go to

Next record: ANTIKUSEET aarhus universitet, Aarhus
 Previous record: Seoul National University, Museum, Seoul

Fig. 1. Detail example of a record: the Musée de Louvain-la-Neuve.

UMAC Worldwide Database of University Museums And Collections (under construction)

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Edit Record Cancel Delete this record Logout

*to guarantee proper data retrieval and display, fields marked with * should have an entry.

Name*: (local name of collection/museum)
 Musée de Louvain-la-Neuve

Name in English: (only if local name is not in English)
 Museum of Louvain-la-Neuve

University*:
 Catholic University of Louvain

City: (leave empty if none)
 Louvain-la-Neuve

Continent*:
 Europe

Country or Territory*:
 Belgium

State or Province: (when applicable)

Current Subject(s):
 "untick" those you want to remove
☒ Archaeology
☒ Art
☒ Art History
☒ Ethnology

Add Subject(s):
 use Ctrl to select more than one item
 African Studies
 Agriculture
 Anthropology
 Anatomy
 Anthropology
 Arabic Studies
 Archaeology
 Architecture
 Art
 Art History
 Asian Studies
 Astronomy
 Biology
 Botany
 Cartography
 Chemistry
 Christian Archaeology
 Classical Archaeology
 Classical Studies
 Computer Science
 Cryptology
 Cultural History
 Dendrology

Add new Subject(s):
 one item each box, please

Current Type(s):
 "untick" those you want to remove
☒ Museum

Add Type(s):
 use Ctrl to select more than one item
 Aquarium
 Arboretum
 Archive
 Art Gallery
 Astronomical Observatory
 Biological Station
 Botanic Garden

Add new Type(s):
 one item each box, please

Fig. 2. Index of "Archaeology."

This object index will require a specific research project for development and to apply for funds. What else in the world comprises such a huge number of disciplines as university collections and museums? UMAC should point out the multidisciplinary nature of its “business,” and make use of its distinct character and potential to be innovative for its own benefit and the benefit of the museum community at large.

5. Other Information

A complete record will contain the following information:

- Name of the Collection/Museum (with a link to the corresponding web site, if applicable)
- Name in English
- Name of the University (with a link to the corresponding web site)
- City
- State or Province (where applicable)
- Country or Territory
- Continent
- Type or Types
- Function, applying to the “Collection” type, such as Research, Teaching or Research and Teaching
- Subject or Subjects
- Address
- Opening Hours
- Contact
- E-mail
- Phone

- Fax
- Additional Information
- Description
- Further Reading

User Interface

The main purpose of the user interface is to facilitate and support the creation and editing of records for the database (Fig. 3). The interface enables editors from any computer around the globe to access and write into the database, which physically is located at the Humboldt University of Berlin, Germany.

To create or edit a record requires a login and password, which are restricted to a certain number of designated UMAC members. Each new record is sent to the database system. After checking the record, an editor with publishing rights has two possibilities. If the record is acceptable, it receives “open” status and is available for public access. If the record is unacceptable, it either may be edited by the administrator immediately, or the status may be set to “revise,” which indicates that the record needs to be revised by the editor. This procedure guarantees controlled data entry and terminological and conceptual consistency.

Furthermore, the database system provides a special feature which enables the editor to make a suggestion for a new type or subject. Usually, an editor may choose a type or subject from the current list. However, if a term is missing, an editor may send an appropriate suggestion

The screenshot displays the UMAC Worldwide Database web interface. At the top, it says "UMAC Worldwide Database of University Museums And Collections (under construction)". Below this, it mentions it was compiled by members of the ICOM committee UMAC (University Museums and Collections) and lists the project chair and team. A navigation menu on the left includes "Index" and "Login". A "Quick Search:" bar with a "Search" button is on the right. The main content area shows a list of museums, starting with "Africa > South Africa > Durban" and "America > Canada > Saskatoon". Each entry includes the museum's name and location. The list continues with "Georgia Southern Museum", "Museum of Natural Science", "Harvard Museum of Natural History", "Michigan State University Museum", and "Museum of the Rockies".

Fig. 3. Detail of form for data entry.

to the administrator who then decides to incorporate or reject the new category.

Guidelines

To facilitate data entry by multiple individuals, guidelines have been developed and are available on the web in PDF format. These guidelines describe the structure and categories of the UMAC Worldwide Database. Their purpose is to provide content format rules and thereby ensure terminological coherency and accurate information access and retrieval by users.

Future Development

So far, only a few people have had the opportunity to test the database. There are still a lot of questions to answer and problems to solve. Nevertheless, those UMAC members who want to enter data about their country or state will get a login and a password. However, for reasons of organization, it is not possible to give a login to each UMAC member.

Concluding Remarks

The UMAC Worldwide Database is like a business card which can help promote university collections and museums. Therefore, all UMAC members have a stake in supporting this undertaking.

1. It is necessary to test the database and give feedback on terminological, conceptual and technical problems.
2. UMAC wants to encourage its members to enter data for a certain state, country or even continent.
3. UMAC needs strong support to develop the object thesaurus, including knowledge of existing indices in any discipline and know-how about constructing such an index.

The best way to proceed would be to form a special task force of collection holders from different academic disciplines to establish a specific UMAC project (which would apply for a grant).

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Acknowledgements

We would like to express our sincere appreciation to Martin Stricker, who provided the essential technical groundwork and fostered the database's development with great engagement and brilliant ideas. We also thank Bernard van den Driessche, who tested the database by entering data from collections and museums in different countries.

Notes

¹ The UMAC Worldwide Database is accessible through <http://publicus.culture.hu-berlin.de/collections>.

SEIZE THE DAY! MUSEUMS IN THE CHANGING CULTURE OF UNIVERSITIES—A CANADIAN PERSPECTIVE

Janine Andrews; Frannie Blondheim, Museums and Collections Services, University of Alberta, Alberta, Canada

Abstract

University museums and collections exist within a changing academic culture where a “seize the day” attitude prevails, where actions are required to be revolutionary and where strategic alliances still promise to make institutions and programs more viable. Building connections with broader communities is now seen as influential and often essential to the academic mission. With museums worldwide, community engagement strategies need to be developed and honed to work within this new culture. Our challenge, as university museum people, is to develop strategies that will position us as leaders to help shape the university’s vision by working collaboratively within the changing culture. Using a framework that outlines the changing continuum of university culture proposed by Hanna (2003), this paper describes how the University of Alberta’s museum system is working within and around the University system to develop projects and programs that strengthen the University museum system while contributing to the strategic direction of the University.

Building a Leadership Vision

University museums in Canada, and particularly at the University of Alberta, have been part of our institutions since our universities were founded. Our collections and systems, or lack thereof, have changed within and alongside our parent institutions. Historically, universities have been slow to change and our museums have followed suit. On occasion, some of our university museums have surpassed our parent institutions in adapting to change, especially with respect to engaging the community, while at other times we lag far behind. Technology, globalization and reduction of leisure time are just some of the factors that have a significant impact on universities and museums as entities. Both institutions are struggling to demonstrate their relevance within our changing world and a fiercely competitive market.

Donald Hanna, in the 2003 *Educause* article “Building a Leadership Vision: Eleven Strategic Challenges for Higher Education,” looks at a continuum of how university culture is evolving and provides 11 strategic challenges for higher education to help build a leadership vision (2003). He suggests that universities are moving from a model where educators work within the rules to one where we have become risk-takers working without a tested methodology. This new model suggests that learners’ needs now drive decision making, not academic programs. Similarly, stakeholders in the community now share decision-making with faculty and administrators. In the past, university faculty and administrators developed programs and projects with resources in hand. Now, it is acceptable to create visions and programs based on speculative venture capital resources and use deficit financing to work within a new concept of “resources in waiting.” Staff members are now required to work collaboratively across disciplines. Organizational structures at universities have gone from being segmented to being integrated and cross-

functional to support the academy’s vision and strategy. Also, staff members are beginning to be recognized based on scholarly and entrepreneurial performance as a group, rather than receiving recognition for individual efforts.

Is the university, as Hanna’s theory states, truly shifting philosophies from “don’t rock the boat” to “seize the day”? If so, at what rate is the change taking place in our individual institutions, and how does this changing culture help make our university museums more relevant to the university community and beyond? Stephen Weil, in many of his writings over the past few years, suggests that museums must focus on the ends rather than the means to make themselves relevant. As he points out:

Unlike individuals, institutions—and that includes museums—have no inherent worth or dignity. No matter how venerable, noble or encrusted with tradition any particular museum may be, at bottom, it is still nothing more than a human fabrication, an organizational contrivance through which some group or other hopes to achieve some short or long-term objective. Whatever worthiness a museum may ultimately have derives from what it does, not from what it is. (*in litt.* 11.2003)

This paper uses Hanna’s theory of the changing culture at universities as a framework for discussing how one university museum system—the University of Alberta Museums, a distributed system with a Canadian perspective—is adapting to these changes. It also will look at what lessons and strategies we can apply from this system to help university museums move towards a purposeful future within our universities’ strategic directions, visions and cultural changes.

Cultural Shift at the University of Alberta

The University of Alberta is located in the Province of Alberta in western Canada. Our university is the second largest English-speaking university in Canada, with a student enrolment of 36,000 and a staff of 7000. Our university is located in the provincial capital of Edmonton, a thriving city of one million people in the greater metropolitan area. Edmonton boasts that it is the “City of Champions”—a claim to fame predicated on nurturing one of the greatest hockey players ever to have lived—Wayne Gretzky—and building the world’s largest shopping mall. Our university also has a desire to be a champion through the international vision of our President.

Within this context, the University of Alberta is experiencing Hanna’s cultural shift in some, but not all, areas of the institution. Our leaders definitely are driving us towards a collective vision, where we regularly hear the mantra of becoming indisputably recognized as one of Canada’s great universities and among a handful of the best in the world. Some of our systems even are changing to ensure that we move forward together on such things as the development and implementation of a university-wide strategic business planning process. Our governments have also forced us to move towards this new cultural continuum by encouraging us to apply to federal and provincial granting agencies to fund large multidisciplinary projects that promise to promote Hanna’s cross-functional structure theory.

Many of our faculty members are beginning to embrace this cultural shift, as well—especially the ones who have been bold enough to apply for the major collaborative grants and become part of these successful programs, at least in the eyes of the drivers and the leaders. University administrators, some of whom have endured years of change-management initiatives, are also demonstrating the use of some of these shifts in designing new systems and processes. We see both our Research Grants and Financial Services offices much more willing to provide seed and start-up money to support a project or vision that ultimately supports the greater vision of the University. We no longer wait for all resources to be in hand before beginning work on proposed projects that ultimately support the University. However, our support staff and some administrative processes, such as the maintenance of our physical structures and our technological budgets, have not kept pace with our aggressive university-wide vision and some of the cultural changes. The University is working on these things.

Generally, the University of Alberta is moving its systems and its people toward the cultural model where a collaborative “seize the day” attitude prevails within a collective, but not yet fully-embraced, vision. We are becoming more collaborative and more integrated in our processes and systems, but it takes time to make a

cultural shift of values that have been entrenched for decades. Most academic environments still support a culture and a model that allows individual egos to advance personal visions, despite the institution-supported vision and model.

Not all would agree that the continuum proposed by Hanna is desirable. It may take us years to reach a fully collaborative, integrated “seize the day” attitude, or we may never completely get there. The important point is that this cultural shift is taking place at the University of Alberta, and we need to understand how to work within this shifting environment, or help to change it.

Community Engagement and the University of Alberta’s Vision

As our culture has shifted at the University of Alberta, many of our systems and programs are also changing and some are being redefined. One prime example is the institution-wide shift toward community engagement with University of Alberta programs. All departments at our university are being driven to do outreach programs, and as they do so, these units are realizing the benefits of making the results of their research and research stories known to the public. It is no longer just the museums that bring school groups to campus or attract media attention, for example, but several departments and areas are now involved with outreach.

In fact, outreach has grown so much that one year ago, our Museums department facilitated a campus-wide workshop, in partnership with the University’s Public Affairs Department, to determine how widespread community engagement was, and in what ways it was done. We found that there are many, many programs across campus—from the Engineering faculty offering science camps for kids to the University Museums offering Science Sundays. We concluded that the University needs a more coordinated approach across campus to engage the broader community from a University perspective. More centrally-assigned funds and a redefinition of community engagement are needed if we are all to support the President’s vision in a strategic way.

The result of this discussion, for our museum system, is that we have learned that while our university culture is shifting to a more collaborative structure, we are no longer the only kids on the outreach block, and we need to learn to play with the other non-museum programs and be more aware of opportunities within the University.

University of Alberta Museums: Seizing the Day

The University of Alberta is one of the oldest collecting institutions in western Canada, having collected everything from artwork to zoological specimens for about 90 years. We now boast that we house one of Canada's largest collections with unconfirmed numbers of 15 to 20 million artifacts and specimens.

Our collecting behavior, like that of many universities, resulted from passionate researchers and dedicated and interested supporters of the University, which includes alumni, friends, family and political allies. Our collecting probably started in a haphazard way, but was always strongly fuelled by each individual's curiosity and passion for finding answers to questions such as: why is the Province of Alberta home to vast paleontological resources? What is our connection to the Group of Seven artists, and why did one of their most prominent members travel all the way to Edmonton in the early 1920s to paint our first President and our first Chancellor?

Unlike many other universities, we do not have a large central edifice to pay homage to our collections and museums. Not that we wouldn't like one, but this scenario has just never worked out for a variety of reasons. Instead, we have a distributed system of 35 museums and collections across 16 different academic units and four faculties at the University. This system is supported by: an academic service unit called Museums and Collections Services; a Collections Committee, which is responsible for policy creation and policy monitoring for all campus collections and collecting activity; a Curators Committee, which is a resource sharing forum for academics who are designated as curators or collections representatives; volunteer programs; and a Friends of the University of Alberta Museums organization, which provides connections to the broader community, raises funds and continually reminds us of our role to support our first President's vision through our museum programs. President Tory stated:

Universities must be conducted in such a way as to relate them as closely as possible to the life of the people. The people demand that knowledge shall not be the concern of scholars alone. (qtd. in Corbett 1992)

Our collections, like those of many universities, are spread out all over campus in a variety of locations. We have some museums that have large exhibition spaces while others have only the occasional display case. Some collections provide access via visible storage, while others provide access only in their labs or via other controlled environments. But, all work together in a collaborative model.

Our system is definitely distributed and relies on people and the belief that university museum resources are integral to the mission and vision of the university as stated in our campus museum policy, which is approved by our Board of Governors. But more importantly, our system relies on being strategically linked to the broader university vision and mission. In many ways, our University Museum system has already unknowingly embraced many of the cultural shifts that the broader University is beginning to accept. This does not mean that we have abandoned the existing systems or framework. It is important to know when to embrace systems that work and reinforce partnerships that exist on campus. It is also important to recognize that all situations are not the same, so a selective strategy needs to be applied.

Using a selection of Hanna's eleven strategic challenges, the following examples provide a means to understand how the University of Alberta Museums and the systems that help them function are adapting to the shifting culture, and the "seize the day" attitude.

Removing Boundaries

What is "on-campus" and what is not, will become less and less apparent...activities and boundaries will be increasingly blurred as a result of the greater communication, and interactions made possible by increasingly powerful technologies. (Hanna 2003)

Boundaries in the University of Alberta context can be those that separate the museums from the rest of campus, as well as those between the university and its broader communities. Our museum model supports initiatives that emphasize communication across campus and with the broader community. The benefit of our distributed museum system, for example, is that our community of curators intersects most faculties and departments on campus. Curators, in our context, are professors with research and teaching responsibilities who have been designated to be responsible for collections within an academic unit or discipline. They come together to work strategically on issues that affect the whole community and link the concerns back to their academic units. The Collections Committee, which approves policy and reviews issues such as deaccessions and funding opportunities, consists of representatives from across campus (and not just from units with museums) and includes students and a community member. Because this committee reports to the General Faculties Council and the Board of Governors, the issues, opportunities and initiatives of the museums reach a broad campus audience as well.

The University of Alberta Museums Virtual Museum web site, as described below, is a step towards removing boundaries for audiences that range from

children in our local community to scholars on the other side of the globe. Partnerships and alliances will also serve to remove these boundaries, as described in the Alberta Natural Science Information Facility proposal, which, through the Internet, seeks to unite collections and researchers from around the Province of Alberta.

Supporting Entrepreneurial Efforts and Technology

Hanna suggests that the implementation of learning technologies to increase access has met with minimal support from faculty, as universities do not support this kind of entrepreneurial activity with appropriate funding resources. Certainly, this is the case at the University of Alberta. Though a sizeable budget is allotted to support the technology infrastructure across campus, it is still not enough to cover all technology needs, ideas and initiatives, as these are costly ventures. Though Museums and Collections Services does not have an annual operating budget for online projects, in any given year we may receive a fixed amount for capital purchases, seed money towards an initiative. We are fortunate, however, that we can avail ourselves of the campus-wide infrastructure. Despite a shortage of funds, Museums and Collections Services has implemented a project to develop distributed databases for most of its collections, and further develop the Virtual Museum, which provides online access to a range of resources supported by the databases. In many collections, applications have been piloted, such as georeferencing systems, or partnerships have been explored on campus with researchers in computing science looking to capture three-dimensional objects and spaces in unique ways. We have accomplished these initiatives primarily through a range of successful grants, applications to federal and provincial agencies and industry partners.

Redesigning Support Services

As institutions become more focused on customizing programs for students, support services are being redesigned to be delivered flexibly, through multiple pathways. (Hanna 2003)

The University of Alberta Museums system consists of our Curators Committee and the collections they represent: the Collections Committee; our community group, the Friends of the University of Alberta Museums; and the Department of Museums and Collections Services, which is the central unit and coordinating body for the system. Museums and Collections Services, as an academic support unit, works individually and collectively with the academic community to identify service needs and ensure that they are addressed appropriately and that museum standards

of practice are in place. Collections share many needs in common, but many collections have needs unique to their discipline, collection, academic program or student body.

This system or model has worked well for the University of Alberta and its distributed museum community. We have just launched a strategic planning process, which for the first time is being conducted on a campus-wide scale for museums. We will be working with internal and external stakeholders to develop a vision for the University of Alberta Museums as a whole (that supports the University of Alberta vision and mission) as well as working with the business units within Museums and Collections Services to determine the implementation process needed to achieve the vision.

Coupled with this initiative, the University museums are undergoing an audit for our federal Cultural Property Review Board, which bestows the important "Category A" status on the University museums in order to allow the institution to collect cultural property in a number of categories (e.g., textiles, art, paleontological specimens). The audit asks us to review all of our physical spaces for fire, conservation and security requirements as well as all of our museum policies and procedures. Though a considerable amount of work, it allows us to have a snapshot of our current status and consider options for the future that could include a central storage facility, or improved facilities at each location. Without our museum system and the full support of other units on campus, such as Facilities Management, Campus Security and Occupational Health and Safety, we could not tackle such an undertaking.

Emphasizing Connected and Lifelong Learning

The real need is for people who are adaptable and who know how to learn and problem solve. ...Taking advantage of context, collaborating and constructing knowledge will be valued skills. (Hanna 2003)

The University of Alberta Museums has developed two initiatives that address children, as an outreach function, as a recruitment tool and as a means of cultivating lifelong learners. Both projects incorporate the provincial government-mandated curriculum. The Muse Project provides teachers and their classes with access to our museum system—which is not easy for the external community to navigate—through on-site tours, discovery kits for use in the classroom and web-based resources. The underlying theme is "From Wonder to Wisdom," which translates the research process into a series of five steps: wonder, focus, discovery, fusion and wisdom. As junior researchers, students learn how and why universities have museums, collect museum objects

and learn a variety of multidisciplinary skills that can be applied in a variety of contexts. Further information on this initiative can be found on the Muse Project web site located at <http://www.museums.ualberta.ca/resources>.

The second project, "KidZone," is an interactive web site for kids located on the University of Alberta Virtual Museum Web site at www.museums.ualberta.ca/kidzone. Children are invited to explore mysteries in the University of Alberta Museums through a series of games, stories and activities. KidZone is hosted by the characters Wendy and Iggy, two friends who begin all their adventures in a clubhouse built in a backyard tree. By exploring the site, children can gain a better understanding of what research is and how it relates to our daily lives, and become familiar with museums in a university context. The learning experiences at KidZone, while based on Alberta Learning's K-12 curriculum, are informal. They are fully bilingual in English and French (Canada's two official languages) and accessible to the visually impaired who use text readers.

Building Strategic Alliances with Others

All colleges and universities will seek to expand their web of alliances with others in the future. (Hanna 2003)

Through our strategic planning process, we are looking at partnerships and alliances, as well as a range of opportunities that are possible through these partnerships. However, it is important to complete the strategic plan first, to determine where the most strategic partnerships lie. Partnerships and alliances naturally develop through the course of project development and implementation. Partnerships with our local school boards and the Faculty of Education on campus for our Muse Project, for example, have proven to be valuable alliances for the U of A Museums as a whole and beyond specific projects. The Alberta Natural Science Information Facility is a prime example of proposed partnerships and alliances, not only with other post-secondary institutions, but with government agencies and natural science organizations. Dr. Felix Sperling has described this project in his article titled, "Unlocking the Legacy of Alberta's Natural Science Collections." This project is pending funding, but should it not materialize, the process of seeking partners and investigating the future of such an initiative has expanded the web of alliances for this and other projects.

Measuring Program Quality

A dramatic shift in how quality is measured—with flexibility, responsiveness, timeliness efficiency and applicability becoming new, important measures of

quality. ...Criteria for institutional accreditation and program quality assessment are changing to reflect more specific measurements of learning. (Hanna 2003)

The University of Alberta, as part of its four-year planning cycle, sets the expectation that each unit will determine performance measures and identify benchmarks. Our provincial museums association, Museums Alberta, has just launched its "Achievement Program," which is an extension of its standards practices handbook, and has been many years in the making. The University of Alberta Museums has adhered to the standard practices handbook, and is looking to incorporate the Achievement Program into its strategic planning process. An extension of this program could be the development of benchmarks and measures applicable to the whole province. This could also be an initiative for UMAC to develop a set of benchmarks and measures that are meaningful in the university museum context.

Achieving Institutional Advantage

The abundance of opportunities demands greater focus and clarity about purposes and competitive strengths as institutions compete in a larger, more complex marketplace. (Hanna 2003)

One of the University of Alberta's competitive strengths is the University of Alberta Museums. Without the model and system that support the museums collectively, this strength may not have been realized and subsequently recognized. Although the university has supported museums for close to a century, it is only in the past few years that senior administration has recognized the value of the museums in relation to its broader vision, and it may or may not be because of the model.

Addressing many of the strategic challenges that Hanna has proposed might be natural outcomes of the model that the University of Alberta Museums has implemented. Some have been deliberate choices in accepting the cultural shifts and exhibiting the cultural traits required to seize the day. Our model is built on collaboration within the university environment and beyond by ensuring that our community is involved in our decision-making processes. We recognize the need to be integrated—ensuring the museums are embedded in a range of university programs and services, and extending our unique museum skills to the University for some non-museum related activities. Our model allows us to work on system-wide projects, such as developing repatriation and other policy documents for all collections, but within the context of the University. Our current strategic planning process hopefully will allow us to identify potential new strategies for our

museums both within the university and beyond. We have understood for several years that vision and strategy are important for the University of Alberta, but because of our collective model, they have become equally important for the University of Alberta museums.

Some Final Advice

Seize the day! Our distributed museum model for the University of Alberta definitely has allowed our museums and collections staff and our faculty to work together campus-wide to implement considerable change and progress for our museums. The system is not perfect, and we continually struggle with issues such as inclusiveness and maintaining a good communication strategy campus-wide as the administrative structure and its personnel change. We know our system is dependent upon vision, strategy, personalities, policy, collaboration and flexibility. Our model depends on several activities which have been collectively identified: ensuring intellectual and academic freedom in the pursuit of knowledge; benefiting the entire University and its many disciplines, departments and programs; assuring the highest possible care for our collections; encouraging bold ideas in research, teaching and community engagement; being steadfast in the pursuit of new knowledge created through the interaction among, and within, individual collections and curious minds; showing respect for, and being accessible to, our diverse communities; and supporting lifelong learning through fascination with objects and specimens and the ideas that result. We do feel that, because of our collaborative model and by actively acknowledging that the university culture has shifted and is shifting, we are much stronger as a campus museum community than if we each operated as single university museums or collections in isolation, or in competition with each other.

In order to ensure that our university museums are relevant to our university specifically, and to society in general, and that our museums are not seen as merely an administrative contrivance, we strongly believe that we must be connected to the university's larger vision and have a role in shaping it. We must always be diligent and observe the changes that are taking place in our academic environments and beyond, so that we can embrace change where relevant. As we have found, a "seize the day" attitude has helped us move forward on several initiatives that have become important to the university as a whole.

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MUSEUM EXHIBITIONS AND THE CONSECRATED OBJECT

Mauricio Candido da Silva, Specialist in Museology, Museu de Zoologia da Universidade de São Paulo, Brazil

Abstract

The purpose of this paper is to present some ideas on museum exhibitions and aspects of significance of the museum object. It aims at understanding the changes in meaning intrinsic to a museum object—the different meanings resulting from museological processes in its institutional life.

The object selected for this study was an archaeological vestige, a human skull called *Miss Sambaqui*, belonging to the collection of the Museum of Archaeology and Ethnology of the University of São Paulo, Brazil. This research tested the proposition that when the same museological object is submitted to various exhibitions that belong to different kinds of scientific museum collections they reveal fresh, new values about the object.

Introduction

This paper is the result of an applied museological research project developed between 1999 and 2000 at the Museum of Archaeology and Ethnology of the University of São Paulo, Brazil. The research examined a specific object in a research collection of a university museum with the purpose of studying its different meanings when submitted to a museological process, i.e., being collected, preserved, researched, communicated, analyzed and evaluated. Through a case study, I investigated how an archaeological artifact became an institutional symbol of Brazilian archaeological research and preservation in the 1950s and how this symbol lost its meaning through the years and eventually acquired new salience in another research institution at the same university.

The general objective was to evaluate the capacity of the museological process to change the meaning of a scientific object in a research university collection. To address this objective, and better understand the museum phenomenon, I focused on a specific object, the human skull *Miss Sambaqui*,¹ which is an archaeological vestige (shell mounts) kept at the Museum of Archaeology and Ethnology of the University of São Paulo (De Blasis 1991). I have followed the institutional history of this archaeological vestige as it first was made into a symbol of heritage and later became an institutional symbol. In 1954, after being rediscovered and introduced into a museological process, *Miss Sambaqui*'s image was turned into a stamp for the Pre-Historical Institution of São Paulo. This paper describes the transformations of this object, which was collected, researched, preserved and exhibited in different ways from the early days of Brazilian Archeology until today. The museological process gives the object new meanings.

The Formation of a Symbol

Some dates are important to understand the changes in *Miss Sambaqui*'s meaning. In Brazil, archaeology started in 1954 along the coast of São Paulo State through the work of an archaeological team coordinated by Professor Paulo Duarte.² Duarte was

an important scientist that fought for the preservation of archaeological areas. He created the Pre-Historical State Commission of São Paulo and researched human settlements on the Brazilian coast, trying to discover the remains of the first Brazilian habitants (Duarte 1968). For him, *Miss Sambaqui* was both a discovery and a symbol of the fight for the preservation of archaeological vestiges and sites.³

After *Miss Sambaqui* was collected, it was preserved and displayed in a room at the Pre-Historical State Commission of São Paulo at the University of São Paulo. *Miss Sambaqui* was the most important object on show, and was displayed in the first room that visitors would enter. Unfortunately, there are no images or illustrations of that exhibition, but some reports indicate that *Miss Sambaqui* was actually presented as the first habitant of Brazilian territory.

In 1969, the Pre-Historical State Commission of São Paulo became the Pre-Historical Institute of the University of São Paulo. *Miss Sambaqui* became an institutional symbol. During the same year, Professor Paulo Duarte was banned from the University by the military government of that period. During this time, new archaeologists teams discovered other vestiges of human settlements in the interior of Brazil. Consequently, new theories of human occupation in Brazil were formulated and different vestiges and artifacts were used for reference in studies on the territory's first occupants. Throughout the 1970s, *Miss Sambaqui* continued in its role as an institutional symbol. In 1979, a new exhibition was prepared and the skull was again the principal object. This exhibition celebrated the 27th anniversary of the Pre-Historical Institute. *Miss Sambaqui* was displayed in a case right under the opening title of the exhibition at the entrance to the main hall. The archaeological researches changed but *Miss Sambaqui* continued to represent the same original ideas proposed by Professor Paulo Duarte.

In 1984, the Pre-Historical Institute organized another exhibition called *The Quotidian of Pre-History*, and that time the skull was no longer the main object. *Miss Sambaqui* was still important, but it shared the theme of *first habitants* with other objects (Bruno 1984). With the advance of additional discoveries in Brazil, a

new generation of archaeologists did not accept Duarte's ideas regarding *Miss Sambaqui* being the oldest vestige of human presence in Brazil. Their arguments were represented in that exhibition. *Miss Sambaqui* was displayed in the same case as other coast and countryside Brazilian objects and relegated to a less important area in the middle of the exhibition space.

In 1989, an important institutional transformation forever changed the symbolic character of *Miss Sambaqui*. The Pre-Historical Institute of the University of São Paulo was incorporated by the Museum of Archaeology and Ethnology with two other archaeological and anthropological collections of the University, resulting in a single new institution. In its present long term exhibition, called *Forms of Humanity* and open to the public since 1995, the placement of *Miss Sambaqui* illustrates the fusion of the institutions, as it shares the space with countless others objects (Fig. 1). In this exhibition, *Miss Sambaqui* does not stand alone as an example of Brazil's first habitants, but only serves to illustrate the ones that lived in Sambaquis at the coast. Its importance is similar to the shell necklace and other stone tools exhibited in the same showcase under the theme *hunters and gathers of the coast*.

When *Miss Sambaqui* was usurped as evidence of the first Brazilians in archaeological research, I discovered that the object's symbolism did not die. It has been transferred to another institution called the Biology Institution of the University of São Paulo, where there is a Human Evolution Laboratory coordinated by Professor Walter Neves. He worked in the Pre-Historical Institution of the University of São Paulo from the 1970s to 1980s, and he has a professional track similar to Professor Paulo Duarte. Approximately fifteen years ago, Professor Neves coordinated the team that discovered *Luzia* in the State of Minas Gerais in the countryside of Brazil. Today, *Luzia* is the most ancient Brazilian Human archaeological vestige. Nevertheless, *Miss Sambaqui* is the symbol of his laboratory, not *Luzia*. At the Human Evolution Laboratory, *Miss Sambaqui* represents the continuity of the history of the Pre-Historical Institute and the efforts made by Professor Paulo Duarte.



Fig. 1. *Miss Sambaqui* in the fourth exhibition, *Forms of Humanity*. Photograph by Wagner Souza e Silva.

The Museological Exhibition as Institutional Representation

By selecting a given object and following its museological path, it was possible to better understand the changes occurring in the meanings that adhere to these kinds of objects. Different ways of showing an object can be seen as evidence of the institutional life of the object.

From a theoretical perspective, three basic concepts guided this study. The first is related to the notion of collection:

As any assembly of natural or artificial objects kept temporarily or definitively out of the circuit of the economic activities subjected to a special protection in a closed place prepared for this purpose and exposed to public observation. (Pomian 1984)

This includes objects in the research collection of a university museum, such as *Miss Sambaqui*. The second basic concept refers to the museum object as a document. In its broadest sense, this concept stems from the notions of "testimony," "documentability" and "fidelity" that characterize museological collections as a vessel for meanings (Russio 1983). The third concept framing this research was that of exhibition as a privileged space in the "organization of objects for the sake of transmitting ideas" (Meneses 1992). I have applied these three concepts to understand how *Miss Sambaqui*, when exhibited in university museums and in different contexts, could transmit distinguished ideas as well as reveal institutional changes.

The museological process is understood to be a paradigm (Leon 2000). The process is defined as the collection, protection, communication and evaluation of an object. Its presence or absence decides the status of the exhibition.

Results and Discussion

After analyzing the different ways of exhibiting *Miss Sambaqui*, researching the bibliography, conducting interviews, and studying some images, several questions arose: is there a museological material culture? Could it be that apart from being a "science in formation," museology is also a science of transformation? Is the "museum fact"—the point of departure of public contact with the exhibited object (Russio 1983)—a long moment of the museological phenomenon? Before trying to answer these questions, this study looks for coherence and relevancy in their formulation.

Another challenge related to the definition of a museum object is that for an object to be considered a museological object, it has to undergo collection, preservation, research, communication, analysis and evaluation. From this perspective, it is possible to affirm

that *Miss Sambaqui* is a museological object in the research collection of a University Museum.

The museological analysis, based on a case study, proposes the introduction of the concept of "material culture" (Pearce 1994). This means that the museological object has a special history, an institutional tie, and it has its function constantly transformed by researchers, curators and visitors. If an object in a museological exhibition of an archaeological collection can give many indications of its scientific research and institutional course, the same object in different museological exhibitions displays various forms of "communicating ideas" (Ferrara 1991).

Museology is a "science in Formation" (Russio 1984), and it is subjected to museum collections categories, historical changes and social appropriation. Therefore, it also can be understood to be a science of transformation, regarding the meanings of museological objects. The basis of museology action is structured in the field of representational significance, or the "semiophore."⁴ In the same sense, it is possible to ascertain the museological process when visitors observe the exhibition object. It is in this exact moment that the possibility of the construction of a new form of museological knowledge arises. That form evolves from the personal to the social community experience. This experience is understood as the "museal fact." This allows museological studies to analyze a long historical process, its changing character and social practices that cross the museological process. In a certain way, the consciousness of the communicative strength was present since the exhibitions promoted by Charles Willson Peale at the end of the eighteenth century, where the objects were organized in order to evoke certain effects and sensations in the visitors (Stewart 1994).

Conclusion

"Museum Exhibitions and the Consecrated Object" is a study that aims at searching for the increased value of the museum object. The object is understood to be material support of information that must be continuously preserved, researched, communicated, analyzed and evaluated. This is a dynamic process in which transformation is an essential characteristic. In this way, the old prejudice of museums being places for old things or simply warehouses for ancient materials can be dispelled.

Some recent studies on the working process in museums have emphasized the questions mentioned above, particularly those related to zoological collections. When a zoological object enters the museum circuit, it undergoes a radical transformation from natural object⁵ into museological object (Fig. 2). The transformation of a natural object introduced into the museum process differs from that of an archaeological or any other material culture object in that it has an



Fig. 2. *Changing meanings*. Photographs by author.

aggregated cultural value. The main issue resulting from this study—the presence of a Museological Material Culture—must be investigated differently when related to objects without a cultural past. In addition to its semiophore quality, the zoological object has its original value transformed into a cultural value when it becomes the subject of human's social practices, such as in the realm of museology.

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Notes

¹ *Sambaqui* is a name of Tupi origin that identifies a prehistoric accumulation of marine, river and terrestrial mollusks made by Indians where they would live and bury their dead. These formations are found mainly in the south Brazilian coast. The name *Miss Sambaqui* was given to the skull by the archaeologists that found it, because at that point they believed that it belonged to a woman.

² Before 1954 there were researches, but it was only at this time that archaeology gained scientific accuracy.

³ Professor Paulo Duarte was responsible for elaborating the text that became the first law of protection of Sambaqui areas.

⁴ The use of *semiphore* here and throughout this paper draws from Pomian's notion of the invisible, representational aspect of an object, which is contrast to its utility. See Pomian for greater detail.

⁵ Here, the concept of natural objects relates to the ones that are not made by humans and are not in a museum.

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MUSEUMS AS A MIRROR OF SOCIETY: A DARWINIAN LOOK AT THE DEVELOPMENT OF MUSEUMS AND COLLECTIONS OF SCIENCE

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Abstract

Following the Darwinian approach, which describes a form in nature as the functional adaptation to its environment at a given time, I will explore the development of museums and collections of science as an expression of their function in historical and social context. This approach allows us to establish a classification of scientific museums where features like owner, user, role and use of the object and its social, cultural and intellectual environment act as discriminating factors. This approach may stimulate discussion about how a museum of science could develop to remain attuned to the characteristics and demands of its specific environment, and hence prove to be viable.

Introduction

Sir Winston Churchill's statement, "We shape our environment, and then our environment shapes us," elegantly summarizes the way that society shapes its environment and vice-versa, and the impact of the environment on those who live and work in it and give it its shape. To this relationship, I want to add two closely related elements: time and the impact of the environment on the viability of its inhabitants or "components." As a geologist, I was trained to study, for example, the evolution of a fossil species through time, and how to interpret changes of specific parts of such fossils as the functional adaptation of that organism to alterations in its environment. Darwin taught us that those organisms that are best adapted to their new environment have the best chance to survive. In other words, studying these functional adaptations helps us understand the impact of the environment. My assumption is that the Darwinist principle is also applicable to the evolution of museums. The role and shape of these museums have changed dramatically over the centuries: what started as a Cabinet of Curiosities for the elite has become a theme park for the millions. Subsequent appearances thus can be interpreted as responses to a specific combination of requirements and conditions which change through time and differ from place to place, according to the social, cultural and intellectual environments.

I do not have the intention to rewrite the history of museums and collections of science. This has been dealt with extensively by a great number of authors.¹ Neither is it "new" to claim that museums have gone through "generations" or "phases." The aim of this paper is to present a way of looking at museums as products of their time and environment. My purpose is not only to understand the development of museums and collections, but also to look at their evolution as a tool to plan a viable future for the institutions for which we are responsible.

When we look at the characteristics of early museums of science, we must realize that we cannot apply the criteria and definitions of today, but that

we must look at them as products of their time. They functioned in the scholarly environment of their age and played a specific role in context, as do current museums of science. For terminological clarification, "science" is used throughout this paper in the broad, continental definition of *wetenschap*, covering the full spectrum of human knowledge from mathematics to humanities. Museums of science, therefore, are being considered here as those which deal with the broad spectrum of human knowledge and its related artifacts. Thus, a "museum" is any institution, building or room which holds artistic, historical or scientific objects for reasons of preservation, study, contemplation and exhibition. Assembling objects, studying them and maintaining them within a specific intellectual environment is an essential role of such museums. In short, museums are institutions that keep collections for research and presentation. It is the latter aspect of museums that I concentrate upon in the context of this paper.

A New Classification

Already before 1996, when the Utrecht University Museum moved to its new premises, I felt the need for an instrument that could help in the design of the new museum for which I was then responsible. As I saw it, this museum had a dual task: the care of the historic scientific heritage of our university (and related collections) and the promotion of public understanding of science, illustrated by the achievements of our scholars. To begin with, I wanted to understand better our position in relation to other museums of science, and particularly, how a university museum with a rich historical collection should respond to the boom in science centers (de Clercq 1989).

In literature, we can find several different classifications.² Typically, these classifications lack clear and objective discriminating criteria and frequently are based on biased assumptions, leading to contradictions and confusion. More particularly, these descriptions usually start with the *Conservatoire*

National des Arts et Métiers (CNAM) in Paris (1794) and the Science Museum in London (1857), ignoring the Cabinets of Curiosities from the Renaissance and the Learned Cabinets from the Enlightenment. The fact that most university museums and collections have their roots precisely in these early museums of science was my main motivation to develop a new classification. Furthermore, while designing the museum of science of the future, it is essential to use well-defined terminology to avoid confusion and getting stuck in semantics.

Looking at developments of museums of science in the western world over the last four or five centuries, we can distinguish five major typologies: Cabinets of Curiosities, Learned Cabinets, Museums of Science and Industry, Museums of the History of Science and Science Centers, which can be regarded to constitute subsequent phases in the development of scientific museums and collections. These “generations” should be seen here as “archetypes,” as the way such museums were conceived in their early mature phase. Their appearance mirrors the intellectual, social and cultural setting of the time. Only a few of these museums still show their original conceptual organization, layout and architecture. Most have changed through time; they have gone through the natural developments of all museums of science, reflecting the developments in the scientific world and the changing requirements of the environment, contemporary fashion and local desires. As a result of the need to “keep up-to-date,” today most museums of science show a mixture of characteristics and functions.

Looking at the way museums of science have evolved, we can see, for example, how the role and status of the object has changed from an almost sacred relic to a disposable interactive prop. The same is true of the user: in the beginning we see a noble gentleman, then an inquisitive scholar and today the public at large. Whereas in the early days, user and owner were one and the same, today the owner may be a public-private combination, with the primary aim to boost the economy of the area. The classification I present here takes such factors and parameters as discriminating criteria, and sets them against the background of the social, cultural and intellectual context (Fig. 1).

Earliest Museums of Science

Eve’s act of picking an apple from the Tree of Knowledge in the Garden of Eden for Adam to taste heralds the crucial role objects have played in the gathering and dissemination of information. However, the development of an elite class of rulers and bureaucrats was necessary before any formal education was possible. In all great cultures of the world, the education of the elite was in the hands of spiritual leaders. The earliest proof of an institutionalized form of education using objects resulted from excavations done by Leonard Woolley and P.R.S. Moorey at the beginning of the twentieth century.

Woolley and Moorey excavated a temple complex in the ancient city of Ur (Mesopotamia), where the E-Dublamah temple contained a school (dated ca. 580 BCE) with “antiquities” of the 3rd millennium (2900 – 2000 BCE) of Sumerian origin (Geerts 2003, L. Geerts *in litt.* 03.31.2003). Collecting objects for curiosity or the enhancement of knowledge eventually led to what we today call “museums,” a word derived from Ptolemy’s *Museion* in Alexandria. The *Museion* was a state-run institution dedicated to the muses (including history, music and astronomy), with research and teaching as primary goals. Since the *Museion* did include collections, which were used in a scholarly context, we can point to it as one of the roots of early museums of science.

Little is known about the history of collections in the western world between the *Museion* and the Renaissance. Of course, precious objects and relics were kept at the courts and by churches and cloisters. For centuries, churches were the only places where the public at large was confronted with works of art; apart from the aesthetic experience, these works of art had the didactic function of illustrating Biblical scenes. In this respect, churches performed the role of museums (Shelton 1994; J. Gorman *in litt.* 20.10.2003). Probably most cloisters had gardens with vegetables and fruits, flowers for the altar and medicinal herbs. These gardens can be regarded as the ancestors of the academic medicinal or botanical gardens, the first of which were founded in 1540 at the universities of Padua and Pisa.

Noble Cabinets of Curiosities

From the early Renaissance onward, we find collections of precious artifacts at the courts of the aristocracy. These *Kunst-* or *Wunderkammer* contained portraits of ancestors and celebrities, paintings, prints, classical artifacts like sculpture, vases and coins, porcelain and elaborately worked suits of armor, but also sundials and other scientific instruments, precious stones and curious objects from distant lands, like a splinter of the Holy Cross brought back from the Crusades. Other “rarities” would come from distant parts of the world, including silk from India, spices from the Moluccas, porcelain from China, ivory from Africa or gold from Mexico. These cabinets often contained a library and occasionally had a laboratory for alchemical experiments. Surviving inventories give a good idea of the design and organization of these cabinets. They displayed an almost encyclopedic representation of the known world, encompassing mankind and the rest of the living as well as mineral world. Objects, deliberately chosen for their intrinsic beauty, meaning or value, were often expensive masterpieces, as is illustrated by the magnificent scientific and mathematical instruments from the Medici collection, now in the *Istituto e Museo di Storia della Scienza* in Florence, often bearing the Medici coat of arms. The splendor, rarity and value of

Typology, Generation	Cabinet of Curiosities	Learned Cabinet	Science Museum	Museum of History of Science	Science Center	Museum of Science of the Future
Archetypes, Examples	Francesco I de' Medici, Rudolph II of Habsburg, August I & Christian I of Saxony, Hessian Landgraves	Ulisse Aldrovandi, Frederick Ruysch, Ashmolean Museum, Teylers Museum	Conservatoire Nationale des Arts et Métiers, Science Museum, Deutsches Museum	Istituto e Museo di Storia della Scienza, Museum of the History of Science (Oxford)	Urania, Palais de la Découverte, Evoluon, Exploratorium	
Role of Object	Precious, icon, relic, Represents the world, Reflects status owner	Primary source of information, Catalogues the world	Demonstrates skills & progress of industrialized world	Testimony, Material evidence	Demonstration of phenomenon, scientific principle or concept	Source of information, Authenticity, Adds time dimension
Type of object	Authentic	Authentic	Authentic, Instruction model	Authentic	Interactive props, disposable	Authentic, 'Intangible' Documents <i>humaines</i> , Interactive props
Use of Object	Admiration, Demonstration, Hands-off	Examination & classification of the world, Hands-on	Admiration, Demonstration, Hands-off	Reference, Instruction Interpretation, Hands-off	Interactive experiment, Experience, Hands-on	Experience, Interpretation, Hands-on & -off
Arrangement & ordering of Objects	Importance, value, meaning, allegoric, Aesthetic	Systematic, Specialization, Functional	Thematic, Instructive	Thematic, Historic setting	Disciplinary, Didactic, Entertaining	Interdisciplinary, In context, Stimulate debate
Purpose & function Institution	Contemplation, Reflection on temporal power & intellectual status	Investigate, catalogue, classify & collect the world, Encyclopedic	Demonstrate skills & progress of industrialized world	Archive & repository Document & illustrate the history of science	Promote public understanding of science	Science education, Science participation, Science is part of culture & society
Owner	Aristocracy, Intellectual & social elite	Elite, University, Learned Society	Government	University	Public-Private	Public-Private partnerships
User/Public	Aristocracy, Intellectual & social elite	Scholars & students, Elite & Upper-middle classes	Lower-middle & working classes, Schools	Scholars & students, General public, Schools	General public, Schools, Tourist Industry	Public at large, Specified target groups
Location	Schatzkammer, Court, Studio	Private cabinet, Academic laboratory (= museum)	'Museum castle'	University Museum	'Theme Park'	Museum without walls, Virtual museum
Legal status	Private	Private, University	Government	University	Private sector	Public-private
World view	Renaissance, Humanism	Enlightenment, Encyclopedism	Positivism	Modernism	Democratization, Progress	Emancipation, Heritage awareness
Social, cultural & intellectual setting & context	Knowledge from early writings, Veneration of rare & miraculous, Early universities	Scientific Revolution, Voyages of discovery, Learned societies, Proliferation of science	Industrial Revolution, Great Exhibitions, Science goes public, Education reform	Awareness to heritage, Teaching & research in the History of Science	Information Revolution, WW-II & Sputnik-effect, Limits of Growth	Urbanization, Globalization, Science illiteracy, Long-life expectancy

Fig. 1. This table shows the classification of museums of science presented in the article, based on their form as an expression of functional adaptation to their environment: a schematized representation.

the objects reflected the status and worldly power of the owner. One of the objectives of the *Schatzkammer* of Emperor Rudolph II was to demonstrate the absolute power of the Habsburg house over its subjects. On the other hand, quite a few of these collections—like those of the Hessian Landgraves in Kassel and the Medici dynasty—were meant to be an illustration of patronage and encouragement of scientific research, as well as a demonstration of the learned inclination of the court.

“Cabinets of the World”

Gradually, from the sixteenth century onwards, other members of society started to assemble collections. Among these citizens we find merchants, doctors, apothecaries, clergymen and artisans, like silversmiths and painters (Rubens, Rembrandt). The possession of a collection contributed to the social status of the owner, and this fact certainly explains why wealthy gentlemen became collectors. These collections, however, also reflect the curiosity triggered by the stories and objects that came home from the voyages of discovery, which in turn contributed to the Scientific Revolution. Although such cabinets still held both *artificialia* and *naturalia*, we do see a clear tendency towards specialization. The well-known image of the cabinet of the Neapolitan pharmacist Ferrante Imperato illustrates the close relationship between his profession (apothecary), the composition of his collection and the way in which the cabinet was used for the education of apprentices. These “cabinets of the world,” brought together by inquisitive professionals, preceded the establishment of the Learned Cabinets.

One of the characteristics of these early collections is that founder, owner and user of the cabinets are usually one and the same person. This, as we will see, is in contrast to the Learned Cabinets, which gradually became “institutionalized” as the property of universities or learned societies to be used by scholars and students.

Learned Cabinets

Probably the most important aspect of the Learned Cabinets was the new and innovative role of the object. The outward appearance of the object no longer mattered; the objective information intrinsic to the object became of prime importance. The story the object can tell to the inquisitive mind obtained central stage. Objects became a primary source of information, which could be unraveled and studied through dissection, the use of the microscope, analysis and comparison. This novel information added to a better understanding of the living and mineral world and contributed to the admiration of the marvels of God’s Creation.³ Although many early Learned Cabinets, like those of Ole Worm and the Jesuit Athanasius Kircher at the *Collegio Romano* in Rome, still contained both *naturalia* and *artificialia*,

specialization gradually emerged. Ulisse Aldrovand, for example, amassed an important natural history collection, the remains of which are now magnificently displayed at the *Museo Palazzo Poggi* of the University of Bologna. Other examples of specialized collections are the anatomical preparations of Frederik Ruysch, parts of which were bought by Tsar Peter the Great and shipped to St. Petersburg. Most Learned Cabinets probably were set up by private collectors. Some, like Albertus Seba, would gain great fame with their collections of natural specimens. The renown of the collections and the willingness to allow students and scholars to study them was often a decisive factor in the appointment of a chair at a university. Sometimes, the university would buy these collections, but it was not uncommon that collections remained private property and became dispersed after the death of the owner. In some cases, however, they would be donated to a university. In this way, the collections of John Tradescant, father and son, were donated to the University of Oxford to become the Ashmolean Museum (1683), the mother of all—university—museums. The museum assembled objects of study, and it also included a library, a study room and often a laboratory for closer examination of the objects, and a cabinet where the collections were kept in a specific functional order reflecting the institution’s intellectual environment.

About one century later, the merchant Pieter Teyler van der Hulst donated his collections and fortune to establish the Teylers Museum in Haarlem (1784). The foundation of Teylers museum occurred at a time when Learned Societies flourished during the second half of the eighteenth century. Many were founded and functioned in close collaboration with the local university and could be specialized in, for example, natural history or physics. In Utrecht, the university physics cabinets and the cabinets of the *Natuurkundig Gezelschap* (1777) were kept together and finally became the core of the Utrecht University Museum (1928).

As illustrated above, these collections gradually moved from the private into the public realm. They became increasingly specialized and formed the core of collections for research and teaching at our institutions of higher education. By being studied, and having the results of these studies published, collections became reference collections, and thereby “institutionalized.” I see the Learned Cabinets as the forerunners of today’s university museums and collections. This is especially true for natural history collections, because it generally is unimportant if the object were collected centuries ago, as long as it is well-preserved and has sufficient documentation—and in some exceptional cases even that is not required.⁴ Science progressed over the years, new techniques and new insights arose, permitting new and hitherto unthought-of questions to be asked, but the function and role of the object and collection, as well as its users, remained basically the same.

Science Museum

The original purpose of museums of science and industry is different from that of their predecessors. They are a typical product of the Industrial Revolution and often the offspring of one of the great World Exhibitions, like the Great Exhibition in the Crystal Palace (1851), which gave rise to the South Kensington Science Museum. For the first time, large parts of the public, including the lower-middle and even working classes, were given the opportunity to get in touch with the achievements of modern science and technology. Both the exhibitions and the museums were initiated, founded and run by national governments; influential scientists and/or captains of industry often played an important role as initiators. Apart from the promotion of trade and tourism, education of the public and the need to train and attract skilled labor were among the driving forces.

Contrary to Learned Cabinets, the role of the object and the purpose of the institution was to demonstrate the progress of the industrialized world and to stimulate trade, competition and craftsmanship. The objects were displayed with great care in beautiful and specially-built showcases, and sometimes working models were presented to demonstrate functional aspects.

As time passes, and the museum continues to accumulate instruments and machines that show innovations, the museum gradually becomes a repository. The responsibility for the maintenance of the scientific and technological heritage may easily become a cuckoo in the nest. Furthermore, the rate at which the objects become outdated is progressively in conflict with the primary purpose of the institution—the education of the public with state-of-the-art developments in science and technology. Against this background, we must understand the development of two new types of museums of science: the Museum of the History of Science and the Science Center.

Some of the larger science museums continue to combine these categories, like the South Kensington Science Museum and the Smithsonian Institution's National Museum of American History in Washington DC.

Museum of the History of Science

Traditionally, the instruments, telescopes and lenses kept in academic cabinets of physics and astronomical observatories were treated with great care and kept in special cabinets, usually in laboratories. These objects would be used repeatedly for many years, particularly in the education of students. During the latter part of the nineteenth century, research became the second primary task of universities, and the use of these objects changed quite dramatically, as a range of new instruments was introduced and existing ones turned obsolete. After

World War I, various initiatives in a number of European countries led to the establishment of Museums of the History of Science:

- Museum of the History of Science, Oxford, 1925
- *Istituto e Museo di Storia della Scienza*, Florence, 1927
- Museum Boerhaave, Leiden, 1928
- Utrecht University Museum, 1928
- Whipple Museum, Cambridge, 1944

Most of these museums are found in academic environments. Their goal is to assemble, study and display the valuable historic scientific instruments scattered in their institutions, and to preserve them as evidence of the history of the institution and its famous scholars and alumni. Many of these museums, in one way or another, are related to research and education in the history of science and aim primarily at scholars and students in that field.

Science Center

Science centers differ fundamentally from museums of science, as they primarily are devoted to science education instead of the care of objects. Science centers use purposely built (and disposable) hands-on or interactive devices, so-called “props,” instead of real objects. These props are developed to demonstrate a particular physics experiment, scientific principle or natural phenomenon; they are models instead of authentic objects from the real world and are arranged in a didactic and entertaining way, transmitting the message that “science is fun.” In this way, science is presented as a one-way success story, usually with little attention to the interdisciplinary and open-ended scientific process of trial and error, for the human and social context or for science as an ever-present and indispensable component of our daily world. Science centers cater to school-groups and the general public, including tourists.

Urania (Berlin, 1889-1928) is called by some authors the prototypical science center. Devoted to “the pleasure of scientific discovery” (Lührs 1992), it exhibited no less than 88 physics experiments that could be controlled via simple electrical devices. *Urania* closed in 1928 due to the post-war economic crisis, leaving no recognizable trace except one photograph. Consequently, most historians refer to the *Palais de la Découverte*, created in 1937 after the 1936 Paris World Exhibition, as the first science center devoted to science education of both young and old with the use of interactive devices. Other classical examples include the *Evoluon* (Eindhoven, 1964-1989), which was founded by Philips and closed after 25 years, the Exploratorium in San Francisco (1969) and the Ontario Science Center in Toronto (1969).

The birth and success of science centers can be interpreted as a response to a widespread need for reform

in science education prompted by, among other factors, the impact of World War II, the so-called Sputnik-effect, the “belief” in progress due to “value-free” (i.e. “clean”) science, the democratization of knowledge and education, the study *The Limits of Growth* by the Club of Rome (1972) and the pressure from industry to recruit young scientists. Traditional science museums had become inflexible dinosaurs, repositories for objects from the past, unable to satisfy these new social demands. Notwithstanding efforts to develop special galleries like the Launch Pad at South Kensington’s Science Museum, museums of science and technology increasingly triggered nostalgia instead of excitement about new discoveries.

The explosive growth of the population in areas without traditional collection-based museums also created opportunities for innovative hands-on science education initiatives. Frank Oppenheimer’s Exploratorium in San Francisco is a world-famous example. Since its beginning, the Exploratorium served as a model for hundreds of science centers all over the world. The publication of the Exploratorium’s *Cookbooks*, offering a detailed description of its exhibits, invited imitation and proved a decisive factor behind the boom in science centers. In the seventeenth and eighteenth centuries, a clearly visible tower for astronomical observations contributed to the status of a town and its academy, and it became fashionable to have one. In a similar way, the success of science centers and their ability to attract large numbers of visitors was such that city councils and local governments all over the world started competing in setting up science centers. Architects were hired to build spectacular and glamorous high-tech buildings that would act as landmark and attraction. Although form should follow function, ambitions to create an architectural landmark lead to perhaps beautiful but inefficient buildings, excessive operating costs and the subsequent shift of the primary goal from science education to the attraction of large numbers of the public. As a result of the need to concentrate on visitor numbers instead of content, many such initiatives led to both conceptual and financial disappointment, which in turn triggered an unfortunate climate of reluctance among universities, politicians and industries to invest in museum-based science education. The effect of the availability of ready-made interactive devices (or even complete exhibitions with a minimum floor space of 700 m²) was that many science centers gradually became institutionalized hands-on exhibition centers, with the use of interactive devices as a goal in itself, whereas the science center movement as such has lost its direct link to the scientific world.

Furthermore, the ill-defined use of the word “science center” is not helpful in the discussion of how best to tackle museum-based science learning or how to develop a new museum of science. A recent study informs us that there may be about 1500 science centers

or science-center-like institutions in the world today, with an attendance exceeding 275 million visitors a year (Persson 2002). Science centers would be extremely successful if they could indeed boast such figures. However, in his study, Persson defined a science center as:

A physical venue using interactive exhibits to popularize science or technology for a general audience. It may use other methods, as well. In this broad definition, some institutions that primarily classify themselves as e.g. natural history museums or aquaria may be included. (qtd. in M. Quin *in litt.* 06.11.2002)

In other words, although Persson’s study illustrates the success of contemporary science museums and science centers,⁵ it remains unclear which part of this success can be attributed to “real” science centers⁶—as an “institution”—and which part to science museums that make use of interactive exhibits as a technique. Clearly, a substantial part of these figures come from the wide range of traditional science and natural history museums, zoos etc. that have introduced interactive exhibits in their displays. It is by consequence unclear, unfortunately, which part of the success can be attributed to hands-on techniques and which part to the authentic object; neither do we know whether it is the intrinsic beauty of the object that triggers the imagination, or the story it can tell.

Museum of Science of the Future

As we have seen, over the years museums have played a considerable role in science education and certainly will continue to do so. The growing demand for young people pursuing scientific careers opens new perspectives and opportunities for museums of science. For those considering how to “modernize” their existing museum or to start a new one, it may be tempting to look only at successful initiatives around the world or even merely to copy one of these. However, it is quite possible that circumstances in the local environment are fundamentally different and chances are high that doing so will lead to failure (as illustrated by the Amsterdam Science Center *New Metropolis*, today *Nemo*). Therefore, before embarking on the design of a new or renewed museum of science, one has to consider carefully one’s position and environment, including the demands of stakeholders, the expectations of visitors, the cultural and intellectual setting, the educational system and the quality of the collections.

Obviously, it is impossible to provide the all-conclusive recipe for the successful museum of science of the future. First of all, its characteristics clearly will be determined largely by the situation of departure, including the presence of an already-existing museum, its collections, the ambition and the scope of the mission, the expected number of visitors, the architecture, other

attractions in the area, etc. Then, of course, to have a fair chance to survive and even become successful, the initiative must be attuned to the local environment and conditions. The sad experience is that all too frequently, the ambition of the founder proves unrealistic and does not take the local characteristics into account.

For larger, already-existing museums, the mere size of their collections compels them to adopt a large setup, requiring considerable investments causing maintenance and operation to be costly. Those that start from scratch, however, are free to conceive their own model. In this respect, universities (or university museums) are, to a certain extent, in a privileged position: their collections are usually of high quality and cover a wide range of disciplines, enabling an interdisciplinary approach. Furthermore, they have easy access to the wide range of resources in academia. On the other hand, most university museums are forced to work on a modest scale, because universities generally work under financial constraints, and do not regard keeping museums as a priority. The challenge, of course, is to turn this apparent incongruity and disadvantage into a strong point, to take advantage of the fact that the museum belongs to the university and is obliged to work on the human scale, to do interdisciplinary work, to reach out into the public domain and thus show science to be an integral part of our society. At this point, I wish to stress again the need for science to be presented in the broadest possible way, encompassing all fields of human interest and scholarly research.

The challenge for the future is to find a contemporary and fresh formulation of the science center, which most likely will seek to integrate science education techniques developed by these centers and the use of the authentic object. Although it is impossible to predict the definitive design of the successful museum of science of the future, it is possible to draw some conclusions from the way current prevailing worldviews and global trends will probably affect discriminating factors and shape future museums.

a) The Purpose & Function of the Museum

Collections will no doubt continue to be the core business, in fact, the *raison d'être*, of museums. After all, urbanization and the increased use of IT (Information Technology) have rapidly transformed the museum into one of the rare places where the public can get in touch with the real object, the story it can tell and the culture it represents; this is particularly true of objects from nature. The possession of collections of high quality and the way they are used by the museum and made available to the public will become one of the discriminating factors and a key to success. Here lies a unique chance for university museums.

Science education always has been part of the mission of the museum of science. This will increase, partly due to the decline in the use of objects for

research, but also due to the need to attract students for a scientific career. Since this is a point of serious concern all over the world, it is likely that the public sector will take its responsibility and create openings for innovative initiatives. Museums can seize the opportunity and play an active role in science education, making it one of their main tasks.

Science participation follows naturally from science education. A growing number of well-educated, active elderly people (due to demographic developments and increased health and life expectancies) are eager to participate in intellectually challenging and relevant activities. Moreover, citizens increasingly are asked to have their say in political matters that involve sometimes-difficult scientific issues. Museums can offer such facilities and thus strengthen their position in society and demonstrate that science is indeed part of our culture and society.

b) The Object

Objects remain the **primary source of information**. Models, and later interactive devices, have been developed in addition to real objects mainly for educational reasons. This trend reached its climax in the science center movement. The reappraisal of the authentic object and the opportunity for museums to profile themselves guarantee a continued central role for the object in the museum. Traditionally, museums of science displayed objects because they had played an important role in research or were just beautifully made. The challenge for the future will be to display the object for the reason it has been collected: to be a source of information. Museums will continue to use interactive devices, as well as science education techniques and methodologies developed by science centers. The demands of a well-educated and emancipated public and the need to compete with readily available IT-science programs will stimulate museums to display their objects in a wider context, integrating artifacts and knowledge from various disciplines.

Future museums of science will also—to quote Kenneth Hudson: “Place science and technology firmly in their social context” (Hudson 1987).

Museums must be without walls. There is no good reason to restrict science education and/or science participation to within the walls and traditional hours of museums. IT will allow much wider access to the collections and the development of virtual museums. Also, museums will be active in all kinds of outreach activities, including field excursions. The opportunity to study the traces of the impact of science and technology, which we can find everywhere around us in their actual context, will contribute considerably to their understanding, as well as their impact on society and natures, and the worldview from which they originate.

c) Public, The User

The ability to adjust to changes in the environment is a decisive factor for survival, particularly in this field. Museums of the future will continue to cater to their traditional public; they will welcome students and historians of science to work on their collections, as well as the well-educated public at large. Traditional clientele will remain one of the pillars of their existence and there will be programs to support the continuing need to recruit science students.

However, this will not be enough. It will be necessary to consolidate the museum as an integral part of society and respond to demands and opportunities. I have already pointed to the growing group of the elderly and mentioned "science participation" as an instrument to integrate the museum in society. Looking back at the history of museums, only those that were able to respond to the demands of their environment have proven to be viable. For the future of museums, this implies that we must learn to resist the temptation of setting up a museum (or exhibition) from the "supply approach" only, based on the enthusiasm of the curator. Instead, museums must learn to listen to the demands and questions raised by the public. The future public will be well-educated, emancipated and demanding and will expect authenticity, scientific integrity and social relevance. University museums, operating in an academic environment, are particularly well-equipped to respond properly to this demand.

In conclusion, my aim was to develop an instrument to help me design a museum that had a fair chance to fit in its environment and respond to the demands of its public—in other words, a successful museum. We have seen the influence of prevailing worldviews and intellectual setting on parameters like the role of the object, the way it is used and the kind of user (i.e. the public), and we have seen that it is vital for the survival of any museum to engage its community. It follows from our observations that copying a success has a fair chance to lead to disappointment, unless the institution is attuned to its new environment. Planning a viable museum therefore requires an understanding of the past, as well as an analysis of the environment in which it is supposed to operate, including its public and its stakeholders.

The ambition and goodwill of the founder are essential factors for a successful museum. However, it is my conviction that the interaction with the environment eventually will determine whether the museum will be successful. From this, it follows that a museum in Oklahoma will be different from one in Tartu. Similarly, a museum conceived by a city council to boast the tourism industry will differ from another established by a university that cherishes its historical collections and desires to raise its profile through the display of its collections and the scholars that brought them together.

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Notes

¹ See Lewis, Boylan and Lourenço.

² Most authors refer to Danilov's classical paper, written in 1976 while he was director of the Museum of Science and Industry in Chicago.

³ Which, according to James Ussher, took place on the 26th of October 4004 BCE at 9:00 am.

⁴ The bone fragments from the Oxford Dodo were saved from a fire and poorly documented. Nevertheless, these fragments enabled the phylogenetic classification of the Dodo as an oversized, flightless pigeon.

⁵ Miller's report includes a section on the impact of science museums and science centers on the promotion of the public understanding of science, based on the ECSITE report by Persson. Persson's report does not include those science museums, zoos, botanical gardens, aquaria, etc. that do not make use of interactive exhibits. The total number of visitors to science museums at large will therefore be considerably higher.

⁶ In my perception, "real" science centers are institutions whose mission focuses on informal science learning through the use of interactive exhibits.

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TEACHING FROM OBJECTS AND CLASSICS IN A COLLEGE ART GALLERY

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Abstract

The Daura Gallery exists to support the mission of Lynchburg College by being a resource for teaching through the collection, care, interpretation and exhibition of works of art. This paper examines the Lynchburg College undergraduate museum studies program, which combines teaching from the objects in the Daura Gallery collection with the Lynchburg College Symposium Readings, Classical Selections on Great Issues (LCSR). This innovative program connects ideas and objects, and develops critical thinking skills through readings by such diverse authors as Thorstein Veblen, Leo Tolstoy, Chief Joseph and Elie Wiesel. These readings foster discussion of the theory and practice of museum education, exhibitions and programming; ethical standards for museums; issues of sensationalism and pornography; government support of the arts and humanities; the Native American Graves Protection and Repatriation Act; the repatriation of Holocaust-era assets; and other current legal and ethical issues.

Introduction

The Daura Gallery was founded in 1974 with a facility of limited scope and a modest collection consisting of work by the College's art students and regional artists. The Gallery was expanded in 1990 and again in 1995, and the collection now includes more than 1000 paintings, drawings, prints and sculpture. During this time, the Gallery catered primarily to members of the general public interested in local art and the Catalan-American artist Pierre Daura, for whom the Gallery was named and who is represented in the collection with 160 works of art. Little effort was made to reach out to the College community, with the exception of the annual student art exhibition, and by the late 1990s, the College's faculty, staff, students and alumni were increasingly disengaged from the Daura Gallery.

In 1997, under new administration, the mission of the Gallery was expanded and the Gallery became a resource for teaching through the collection, care, interpretation and exhibition of works of art. The Gallery sought to serve the campus and the larger community by providing opportunities for learning, enjoyment and personal growth; by deepening our understanding of human experience and cultural diversity; and by strengthening the creative and curricular life of the College. To this end, the Daura Gallery provided a wide range of changing exhibitions and related programs that actively complement, support, and challenge the academic experience of Lynchburg College students, and encourage the interdisciplinary affiliation of the visual arts with other disciplines of the humanities, sciences, education and business. Also in 1997, the decision was made to establish a museum studies program and use the Daura Gallery as a teaching laboratory.

Lynchburg College Symposium Readings

An integral aspect of museum studies is teaching from the object and utilizing the collections of a college or university's museums and galleries. In this regard, the

museum studies program at Lynchburg College is no exception. What is exceptional about the program is its use of readings from the classics.

Since its founding in 1903, Lynchburg College—a private, coeducational, comprehensive college—has fostered a learning environment that has encouraged reading good books, asking meaningful questions, and reflecting on great ideas. As a continuation of this tradition, the college publishes its own ten-volume set of classical readings through the University Press of America. Lynchburg College Symposium Readings—Classical Selections on Great Issues (hereafter referred to as LCSR) addresses, but is not limited to, such themes as poverty and wealth, tyranny and freedom, the nature of the universe, imagination and creativity, faith and morals, human nature and war and peace. In 1988, the college created a bold approach to liberal studies by extending the use of the symposium readings across the curriculum and engaging students in the discussion of these texts throughout their four years at Lynchburg College.

An LCSR course is a regular Lynchburg College course in which at least 20 percent of the grade is based on written and oral communication related to reading assignments from the Lynchburg College Symposium Readings. The LCSR Program is an innovative approach, integrating selections from classic works to supplement regular class material and providing elements of integration, depth and broad perspectives within the context of regular courses. In these courses, students grapple with the great issues facing humanity from the perspectives of Western and non-Western civilizations. Our mission is to foster interdisciplinary study by all students, to read from texts of classic and modern significance, and to write and speak about them in the context of contemporary society. Simply put, Lynchburg College has committed itself to placing the Great Books of Western Civilization, from Plato to Freud, at the heart of its entire curriculum—whether a student is in accounting, nursing, the humanities, the

sciences or, of course, museum studies (Lynchburg College Symposium Readings Mission Statement 1995). Approximately 10 percent of courses taught at Lynchburg College are LCSR courses.

Museum Studies at Lynchburg College

The museum studies program provides a case study for the LCSR program, as it combines teaching from the objects in the Daura Gallery collection with LCSR. Museum studies at Lynchburg College is an interdisciplinary program that stresses theoretical concepts and develops practical skills that will prepare students to understand museums as a cultural and educational resource. It is currently the only interdisciplinary undergraduate program in Virginia. The minor is open to students in any major. To date, students with majors such as studio art, business, communication studies, graphic design, history, marketing, sports management and theatre have enrolled in museum studies classes. The program is administered by the School of Communication and the Arts. Close links exist with the School of Humanities and Social Sciences, the School of Sciences, the School of Business and Economics and the School of Education.

The curriculum is structured to provide students with opportunities to pursue academic or disciplinary interests as well as museological interests, thus providing basic knowledge that is essential to the varied professional emphases in museum careers. The majority of graduates in the minor have a strong interest in continuing their education in graduate programs. The museum studies program also helps prepare students for opportunities in arts management relevant to the fine arts, music and theatre.

The fourfold objectives of the program are of equal priority: (1) Students will explore intellectual curiosity, independent learning and new and different ideas, and will build intellectual competencies—analyzing and decision making—through the study of the missions, goals and purposes of museums; (2) Students will develop an integrated worldview and experience the diversity of other cultures through the study of the missions, goals and purposes of museums; (3) Students will gain an understanding of: (a) the historical, contemporary and future nature and role of museums in society; (b) the governance and management of museums; (c) ethical and legal aspects of museum operations; (d) management, preservation, presentation and interpretation of collections; (e) maintenance of physical facilities; and (f) the conduct of educational and outreach programs; (4) Students will combine the study of an academic specialty with the study of museology. Students will learn through formal instruction, individual research and practical experience—through courses of study and internships that teach the history, theory and

practice of museology, and through knowledge of other academic disciplines.

Teaching is object-centered, and the Daura Gallery at Lynchburg College is used as a primary teaching resource and laboratory for the program. This provides students the opportunity to apply knowledge gained in the classroom to artifacts and works of art in the College's collection. The curriculum includes fundamentals of collections management, applied research, legal and ethical issues and practicum experience. Indeed, the program's capstone course involves the students in curating an exhibition, albeit one of limited scope. It does, however, introduce them to the processes involved in planning, developing and mounting exhibitions. More importantly, the program stresses critical and creative thinking skills. Further, it challenges assumptions and advances the concepts that question-raising and engaging in a dialogue should be central to the mission of any museum, that interpretation is never complete, never all-encompassing, but always fragmentary, and that the goals of all museums should focus not on what we are or what we have, but on accountability for what we do.

Incorporation of the Classics

An integral component of the museum studies students' education is global awareness and an expansion of their worldview. This is in keeping with the College's mission:

To develop students to have strong character and balanced perspectives, to prepare them for intelligent and wholehearted participation in a global society and for effective leadership in the civic, professional, spiritual, and social dimensions of life. (Lynchburg College Mission Statement 2002)

This goal is achieved, in great part, through LCSR readings.

While this incorporation of readings from the classics may seem tenuous, the readings enhance and expand the dialogue, connect the course content with the liberal arts education in general, and give students the intellectual and academic foundation with which to seek meaningful answers to life's unceasing questions.

These readings foster discussion of the theory and practice of museums, exhibitions and programming; ethical standards for museums; government support of the arts and humanities; cultural patrimony; the repatriation of Holocaust-era assets; and other current issues in museums. Works of art and artifacts in the Daura Gallery collections are then used to illustrate the concepts and issues, and to make the abstract concrete. I propose that this concept, using myriad readings, is transferable to any museum studies curriculum.

The LCSR course, *Issues in Museums*, examines the ethical and legal issues of governance, administration

and collections management facing museums in the new millennium. Among the objectives of the course is for students to think objectively, logically and reflectively about these issues, and use reasoning and evidence to reach and justify conclusions about the issues.

The LCSR readings that inform the discussion of philanthropy, ownership of artifacts and responsibility to the public are excerpts from Thorstein Veblen's "The Theory of the Leisure Class" (1899), and Andrew Carnegie's "The Gospel of Wealth" (1889). Veblen wishes to obtain a better understanding of the need to build a society with a leisure class, and to develop an understanding of the meaning of *leisure* in modern Western, industrial society. In seeking answers to his questions, Veblen notes that the "emergence of a leisure class coincides with the beginning of ownership" of property. A principal question for students is, "For what purpose does humankind amass wealth and by what standards is success gauged?"

Andrew Carnegie's "The Gospel of Wealth" acknowledges the gap between rich and poor in industrial societies. Carnegie attempts to resolve the contradictions inherent in the creation of wealth, which he sees as resulting from incontrovertible social laws and social condition, while arguing that it is important to retain the lever of wealth for future social progress. He lived up to his word and gave away his fortune to socially beneficial projects, most famously by funding libraries. Discussion revolves around the charitable responsibilities of wealthy individuals. The Daura Gallery and its collections are used as critical examples of patronage and ownership of objects.

The museum studies program also challenges students to recognize the necessity of using multiple disciplinary perspectives that are addressed in the mission and programs of museums to examine complex human issues, problems and themes that affect the world community. The LCSR readings used to discuss the issues of sensationalism and pornography, government support for the arts and humanities, the public role of museums as centers of object-based learning and how museums both reflect and examine past and current social issues through the use of cultural artifacts are Leo Tolstoy's "What is Art?" (1896), Theodore Roosevelt's "An Art Exhibition" (a review of the Armory Show in New York in 1913), and Alfred North Whitehead's "The Aims of Education" (1929).

In "The Aims of Education," Whitehead states, Culture is activity of thought, and receptiveness to beauty and humane feeling. Scraps of information have nothing to do with it. A merely well-informed man is the most useless bore on God's earth. What we should aim at producing is men who possess both culture and expert knowledge in some special direction. Their expert knowledge will give them the

ground to start from, and their culture will lead them as deep as philosophy and as high as art.

This statement informs discourse of the role of museums as educational institutions.

The discussion of the cultural patrimony, cultural sensitivity and ownership of sacred objects has focused in the past several years on the Native American Grave Protection and Repatriation Act (Public Law 101-601). It is informed by Chief Joseph's "An Indian's Views of Indian Affairs," which appeared in *North American Review* in April 1879. This year the dialogue will be expanded to include cultural patrimony and the trade of cultural artifacts by examining the looting of the Baghdad Museum. The LCSR reading for this discussion will be Cicero's *On the Laws*, which focuses on the issue of whether human virtues are the same in every culture.

The discussion of Nazi-era looting and the repatriation of these artifacts is informed by an excerpt from Elie Wiesel's "Night" (1958) that tells the story of the author's childhood and concentration camp experiences, and serves his self-described life task "to give testimony, to bear witness." This subject was powerfully addressed in 1999, when the Gallery held an exhibition on the role of the artist in war, and in 2000, with the traveling exhibition "Anne Frank in the World." The College's semester-long emphasis on the Holocaust included musical performances, lectures and a theatre production of "The Diary of Anne Frank," thus expanding the impact throughout the College community.

Results & Discussion

What is the impact of teaching from the object and from the classics? First and foremost, the museum studies program intentionally expands the conversation of museums into the realm of liberal arts education in general. Assessment data collected during the past academic year indicates that more than 50 percent of all students enrolled in all LCSR courses rated them at four or five (on a scale of one to five).

Sampled students, including museum studies students, respond that LCSR classes (1) have given them the opportunity to broaden their thinking about an important issue or theme either a lot or a great deal; (2) readings, class discussions and assignments have given them an opportunity to improve their comprehension skills and think critically about issues important to society today; and (3) course assignments allowed them to use ideas from at least one other discipline to reflect on an issue or a theme. When asked if they felt the program had improved their reading skills, more than 50 percent of the respondents answered with a rating of four or five. When students were asked to compare their courses to non-LCSR offerings to evaluate their level of classroom participation, discussion, presentations and so on, 80 percent rated their courses with a three, four

or five, with 53 percent rating them at four or five. When students were asked to compare their courses to non-LCSR offerings to evaluate their level of writing in- or outside of the classroom, 81 percent rated their courses with a three or higher, with 51 percent rating them at four or five. Furthermore, students indicated that they became more well-rounded as students, gained more opportunities to engage in classroom discussion and cultivated better understanding of other cultures.

In assessment data collected during the past two years specific to museum studies courses with LCSR selections, 100 percent of the students rated all categories of assessment—stimulating student interest, fostering student collaboration, establishing rapport, encouraging student development and structuring classroom experiences—at a level five. Comments included “stimulating” and “inspiring.”

Comments obtained in personal interviews from two museum studies students further support this documentation. One student who graduated in 2002 with a minor in museum studies said,

At first, I was skeptical about how the LCSR readings could enhance a class in museum studies. The readings didn't seem to have anything in common with a museum. However, the readings make you think and make connections between the past and present you might not consider otherwise. The readings really help develop critical thinking skills. Not only do the readings enhance critical thinking, they also help foster discussion and aid in supporting and making connections between ideas and objects.

Another student, who graduated in 2003 with a major in history and a minor in museum studies, wrote an essay on the legal and ethical considerations of museums under NAGPRA, based on elements of Public Law 101-601 and the Chief Joseph reading. Her essay was one of 11 works by faculty and students selected for the LCSR journal, *Agora*, in 2002 and was runner-up for the College's most prestigious student writing award. She stated,

The museum studies' program at Lynchburg College has an amazing interdisciplinary, multi-cultural approach that not only is applicable to the museum field but to any field that one would choose to enter. Like the museum field itself, the classes take a variety of sources from many cultures and time periods combined with information from the museum texts as well as LCSR readings to give a full, multifaceted picture of an issue or time or work of art or artifact.

Conclusion

Liberal arts education and the museum studies curriculum are indelibly linked through diverse readings in the classics that engage students in an expanded and elevated discourse on museum-related topics. The students who graduate from Lynchburg College with a minor in museum studies are just beginning a path to a museum career, one that by necessity will include further education and practical experience. Whether or not they choose a career in museums, they have developed as advocates of museums, both general and discipline-specific. These students have acquired a love of what museums now do, anticipation of what museums can do, and expectations of what museums should do.

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UNIVERSITY COLLECTIONS AS A TOOL FOR TEACHING MULTIMEDIA LITERACY

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Abstract

The rapidly growing use of digital media demands adequate multimedia and information technology skills. Students without sufficient media literacy are in need of further training. University collections provide a setting particularly suited to teach these much needed skills. There, students can take advantage of the many opportunities to gain skills in various techniques (digital photography, web sites and databases, for example). Such projects are real-life situations of long-lasting value. University collections profit from the fresh ideas and appealing web sites created by the students. Finally, students develop a genuine understanding and interest in the collections.

University Collections

University collections always have been assembled for a particular purpose. Traditionally, the founding of a collection was initiated after the founding of a new academic discipline or department: collections may be, for example, tools and equipment at the lecturer's disposal, study collections for research, teaching collections for the education of the students, and experimental instruments developed for research. As long as a collection fulfils its original intended goal, it usually will be recognized and supported by the university as an aid for teaching and research. As soon as the original goal of a collection ceases to be applicable, however, the collection is relegated to the domain of the meaningless, and in the worst case scenario, it is dispersed. Consequently, purpose is fundamental and intrinsic to a university collection—only its purpose legitimizes its existence. (There are some apparent exceptions, such as collections connected with a famous scientist, commemorative collections or foundation objects, but these usually have a function which is related to the history of the university.)

Recently, the issue of a collection's purpose has become a problem for many colleagues. As soon as a collection loses its original purpose, it becomes difficult to convince administrators to maintain the collection and to continue supporting it financially. Often, the only sustainable choice that remains is to develop a new role for the collection. Many collections or objects can, for instance, be used as evidence for the history of science and to document the development of a particular subject. Sometimes the collections can become "windows into science," aimed at the public understanding of the relationship between science and the humanities. As universities compete with one another, collections and museums can highlight the differences between them. Collections thus can create a distinct profile for a university.

In many cases, however, what usually happens during the search for a new function is an orientation towards free-standing collections and museums

outside of the academic sphere. The result is the forced abandonment of the distinct character of the university collection in favour of the traditional museum concept.

The Application of New Media

At the Humboldt University in Berlin, we are attempting to adopt a strategy that is specific to our university. We are testing new possibilities to integrate collections sensibly into university life. We are offering interdisciplinary courses in the context of general courses of studies. One of the many possibilities is the use of the collections as a tool for teaching media literacy.

Our everyday life—both private and professional—is being increasingly defined by digital technology. Today, computers are used throughout universities. We now use digital cameras instead of film cameras for photographing objects from our collections. This has the advantage of no chemical development or storage of the finished print. Instead, pictures are saved on hard disks and within seconds made available to other persons and departments. Often, photos are categorized comprehensively with the help of media management systems. Databases, in many instances, replace painful and time-consuming index card work—from simple administration to the cumbersome documentation of collections. The application of new media in research and teaching requires scientists and students to possess skills and competencies which usually, at least in Germany, are neither formally developed nor adequately taught in the university. Multimedia projects, which are often developed for teaching purposes and supported by government funding, cannot be realized as planned due to the absence of important prerequisites, namely, basic knowledge of the new media. Indeed, teaching these abilities rarely is included in the curricula of a university, despite the fact that a certain level of competency in media technology is absolutely necessary to bring digital media into the areas of teaching and research.

In the university, not all departments are ready to adapt to students' requests to learn how to utilize new media. Individual disciplines therefore are thankful

when this task is organized and realized by another unit of the university. Here then is a unique opportunity for university collections to assume additional and extremely important functions. In this way, their position will be enhanced and thus consolidated. At the same time, the students' interest for the collections can be awakened.

Teaching Multimedia Literacy

Currently, at the interdisciplinary Hermann von Helmholtz-Zentrum für Kulturtechnik¹ at the Humboldt University, one course and one complementary tutorial in general studies is offered every semester. The themes include "The Application of the New Media in Cataloguing and Presenting Collections," "The Use of Multimedia in the Sciences" and "Learning Museums on the Internet." The Teaching and Learning Center of Multimedia at the Humboldt University pays the tutor costs. Currently, the Multimedia Center is supporting several projects which are improving the application of new media in research and teaching. Additionally, it is funding the required digital equipment. For the time being, there are numerous opportunities to obtain financial support for multimedia projects inside and outside the university.

The goal of the courses is to convey essential knowledge for an exemplary interaction with new media, aided by collection-specific subjects. In view of this goal, the material basis of the university collections plays a vital role. The course "The Application of New Media in Cataloguing and Presenting Collections" includes:

Internet, WWW and Multimedia

- Topics include how the Internet works: protocols, domains, client, server, World Wide Web, HTML, URL, links, bookmarks, search engines, inquiries, catalogues and category indices, portals, etc.
- Web concepts—content, design, user guidance, processing of information, etc.
- Multimedia applications—digitalization, multimedia presentations
- Internet copyright

Museum Presentation

- Advantages of a web presence, criteria for evaluation, categories (for instance, informative offerings ranging from minimal to comprehensive with many links)

Collection Management

- Database systems—conceptual modelling of data, physical organization of data, data models, query language (SQL)
- Inventory and documentation—registration, inventorying, categorizing

- Principles of EDP and the systematizing of information—formalizing data, analysis in logically connected units of information
- Standards and norms—classifications, thesauri, keyword lists

Multimedia applications, web presence, collection management—today these concepts all belong to the daily routine of the collection staff. Why should not this valuable knowledge be passed on to the students? If this special knowledge is not yet incorporated in the collection, then usually a colleague from the computer science department will agree to help.

Other more general aspects that play an important role in contemporary daily life also could be included in this framework, for instance:

- Evaluating the quality of information on the Internet (criticism of sources)
- Knowledge management
- Possibilities and boundaries of multimedia presentations

Insights into current practice are offered by an accompanying tutorial in which the students develop multimedia techniques through qualified instruction and by working on their own projects. Students also will be able to practice presenting scientific information in different new media:

- Creating web sites or web-based presentations, dealing with client/server systems and HTML
- Producing digital pictures with scanners and digital cameras, preparing and distributing pictures for various applications
- Creating presentations for papers and lectures
- Using digital camcorders and video software

There is more than enough material for practical projects with the collections. Ideally, students will have fun creating web sites for collections or objects. Perhaps this process will be associated with the preparation of a paper. Often, students search for an exciting subject for a web site and are thankful when they can work on a real-life project of long-lasting value. In this way, university collections can profit from fresh ideas and appealing web sites created by students.

Concluding Remarks

1. University collections can be placed into a completely new context and eventually play new meaningful roles in the university.

2. The recognition of collections as important teaching tools in the university creates, in the long term, a deeper appreciation and support for collections from lecturers and students.

3. The advantages of offering classes dealing with new media include:

- They are currently in demand and draw much interest.

- Relevant projects are being financially supported.
- The collections offer sufficient material to cover all relevant areas, both theoretical and practical.
- The community requires media literacy and will appreciate engagement in this area of knowledge.

A good scientific collection serves primarily as the basis of the corresponding academic discipline, and this is a valuable goal in itself. Everything else can and should be recognized as additional benefits. In this case, the advantages for both collections and the community are clear. Let us not waste this chance! Let us offer our collections as tools for teaching media literacy and give the community the opportunity to support us.

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Notes

¹ Unfortunately, the translation *cultural technique* does not carry all of the connotations present in the German term *Kulturtechnik*.

HOW TO DEVELOP AN UNRECOGNIZED SCIENTIFIC HERITAGE: THE CASE OF THE UNIVERSITY OF LIÈGE ZOOLOGICAL COLLECTIONS, BELGIUM

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Abstract

This paper presents the nature and value of the zoological collections conserved in the University of Liège zoological museum.¹ The “hidden” collections comprise the scientific heritage of former and even famous researchers (e.g., Edouard Van Beneden and his students) ignored by most University of Liège researchers and administrators, and thus little utilized. Since World War II and the development of official public opening, researchers have not considered the museum to be the central place to preserve their study material and specimens. Collection management in the past twelve years has been oriented toward scientific development of the collections. This has led to the creation of computerized databases of collection holdings, a museum web site, collection care workshops for volunteers, thematic exhibitions, publications and participation in conferences with increasing attendance. Despite the accomplishments and successes of these volunteer activities, the University appears to care little about scientific development, instead favoring the collection’s didactic value and public engagement. The museum and the aquarium actually are merged and collection management of both is the responsibility of the aquarium curator. The total activities, accomplishments and efforts needed to preserve the collections are not considered important enough to justify a separate museum curator. Therefore, the future of the “hidden” scientific collections remains uncertain.

Origin of this Scientific Heritage

The preservation of collections began at the University of Liège with the creation of the University in 1817, through an official decree of *Guillaume the 1st, King of the Netherlands*. The decree, which took place on the 26th of September, 1816, required all newly created universities to collect specimens and maintain collections to support and illustrate the courses and lectures given to the students (De Clercq *in litt.* 2003). Liège is one of Belgium’s oldest universities, along with Leuven and Ghent (Verschelde *in litt.* 2003). By another official decree, on the 10th of February, 1853, the first Belgian King *Leopold I* imposed the requirement to record collection items in catalogs. Specimens in the collection were first inventoried in 1836 and a catalog was produced in 1837. This first official record and the others that followed have been preserved to the present day. They constitute the oldest tracking of collections contents for that time period.

Successive professors in charge of the zoological collections each contributed to their enrichment. The first professor of natural sciences at Liège University, from 1818 until 1834, was Henri-Maurice Gaede, from Kiel. His successor, Jean-Theodore Lacordaire, significantly developed the collections and created a worldwide illustration of animal biodiversity.

Lacordaire was from France; he traveled in South America before arriving in Liège. As an entomologist and systematist (Lacordaire 1834, 1838), he knew the scientific value of reference collections and worked for the growth and worldwide diversification of the collections. A tireless man, he twice accepted the post of Rector of the University (Le Roy 1869; Morren 1873). He bought many mammals, birds and fish specimens

from Australia, Southeast Asia and South America from Francis Laporte Comte de Castelnau. His purchases also contained Castelnau’s diary on fish from South America, fully illustrated with original color paintings made in the field.

When Lacordaire died in 1871, the young Belgian Edouard Van Beneden was called on to follow him, and he became the third professor of Zoology and Comparative Anatomy. Van Beneden twice refused to become the Rector in order to devote himself fully to research and teaching. He organized an expedition to Brazil (Van Beneden 1873) and several projects to collect marine material at the Belgian coast (Van Beneden 1883a, 1883b, 1884, 1887). He succeeded in having a Zoological Institute constructed, in which collections and some research units in zoology still remain more than 100 years later. He developed a Belgian Fauna section among the collections. Under his direction, the collections were related closely to research and also served as study material for his pupils (Van Beneden & Julin 1884, 1886; Van Beneden 1891; Cerfontaine 1891, 1909; Godeaux 1986). His innovative work and his discoveries made him famous worldwide. When he died in 1910, many unpublished or unfinished works remained to be utilized by others (Van Beneden 1923; Damas 1936a; Brien 1968; Hamoir 1986, 1999).

The fourth Professor in charge of the zoological collections was Désiré Damas, a student of Van Beneden with an interest in marine biology (Damas 1904, 1905, 1922, 1936b). He took over teaching the courses and, during the two World Wars, he saved the collections from havoc and destruction. The zoological institute itself was only partially destroyed by bombing, and most of the collections were preserved. Aside from preserving

the collections, he contributed many marine samples that were collected during his Atlantic Expedition in 1922.

After World War II: Evolution of Collection Use and Management

The first change in the role of the zoological collections and the museum happened after World War II with the nomination of Marcel Dubuisson as the fifth professor of Zoology. He also quickly became the Rector of the University. He wanted to promote the collections as a resource for the wider public as well as for the students. He intended to renovate and increase the museum area and create an aquarium.

During the 1950s, two museum curators (namely Fritz Carpentier and Fernande Kraentzel) and four technicians were involved in moving and preparing the specimens for the new museum exhibition rooms. Many research programs, conducted by the University in the Belgian colonies, led to the integration of numerous African animals into the collection. The official public opening of the newly created "Marcel Dubuisson" Aquarium and the renovated Museum was celebrated in November 1962. Both are located in the old Zoological Institute, now called the Van Beneden Institute.

During that period, the courses in the zoology degree became more diversified. Teaching responsibilities were split among several professors. With the ongoing division of the teaching, the Museum progressively lost its role as a central depository and storage location for the study material. Each small research unit held material until the principal researcher left the unit. Then all was stored in boxes and forgotten in the cellar.

There was a break from tradition in 1972, when the sixth professor became Academic Director of the zoological collections of the museum and the new aquarium, following Dubuisson. He was professor of the new course, "Ethology and Animal Psychology," rather than professor of Zoology, Systematics, Morphology or Comparative Anatomy. Fernande Kraentzel, the last former curator, retired in January 1972 and was replaced by Noël Magis, who began to develop a reference collection in entomology and introduce temporary exhibitions in the Museum.

Since the 1980s, major reductions in staff and funding have occurred in the University. Retirees have not been replaced. The museum lost its technicians, including its taxidermist. When the last curator retired in September 1991, the University only supported one temporary half-time assistant position for the zoological museum. Moreover, care and management of the collections was separated from public management, through the creation of a special association devoted to public opening, promotion and financial resources management.

My mission for 12 years, acting as half-time curator in the zoological museum for the professor of Ethology, has been to develop the scientific collections.

Developing the Scientific Part of this Heritage

In contrast to the collections exhibited for didactic purposes in the public rooms, all specimens conserved in the museum depositories are "hidden"—unknown or forgotten by the local researchers. The former curators, however, had organized them systematically in the different depository rooms and cabinets, and they still can be found easily (Fig. 1). I also tried to collect the old study material, forgotten in the different research units or cellars. I often saved materials just before they were going to be thrown away.

From a strictly scientific perspective, the first step in development is to find out what we have. The second step is to diffuse the knowledge among the scientific community, by all possible means. The third step is to welcome scientists to study the material. From the curator's point of view, in a small regional museum, welcoming people interested in the collections is as important as caring for specimens. The museum serves as an identification and information office about animals, welcomes volunteers and collaborators, presents temporary exhibitions and develops public as well as scientific relationships.

1) Establish the State of the Art in Museum Holdings

To achieve the goal of managing information in a modern way, digital databases were created with all the available information copied from the old catalogs using FileMaker Pro on a Macintosh computer (Fig. 2).

Four years were needed to encode the minimal information available in the hand-written records. The process began in 1992. The last museum technician, initially working as an illustrator, provided assistance as a data encoder. New data fields were added, such as systematic taxa, geographic and management fields about location, accessibility, condition, and so on. Data encoding is an ongoing process. For example, we created new single entries for cards referencing multiple specimens. This procedure also needs to be done for the entomological collections where one numbered card refers to several thousands of specimens. A large staff is needed for this to be completed, as the file contains 21,778 cards (Fig. 3).

This reference list of what we have in the collection allows us to sort the data by any data field and to look for particular characteristics. When we make inventories in storage and exhibition rooms, we compare what we find with the database. We find some specimens that have not been previously recorded. These are mainly among the 1872 Brazilian and 1922 Atlantic samples.



Fig. 1. Example of hidden collection: partial view of the birds, reptiles and amphibians depository. Hundreds of bird specimens have been held since World War II in the wood boxes, ordered by systematics. Actual standards of conservation would reject this kind of stocking. The inventory of the cabinets and boxes began in 2001, but has discontinued for lack of human resource. Photograph by E. Walravens.



Fig. 2. The computerization of collection holdings in a database was based firstly on items in the old handwritten registers. This laborious work began in 1992 and continued slowly but surely, mainly thanks to the conversion of the Museum drawer to a data encoder. The next stage is to inventory the holdings really present in the cabinets. Only the cabinets in the exhibition rooms have been inventoried so far. Photograph by author.

Register	Number	Record	N of specimens	N of	Nr in the 1837' Inventory Register	Nr in the 1837' In
Year of Registration	Year of Reg	Day, Month	Day, Month	Complete Date of Registration	Complete Date of Registr	
Number in Cat. Syst.	Number in Cat. Syst.	Card created the		Card created	updated the ...	updated the ...
Genus	Genus					
Species	Species					sexe sexe
Descriptor, date	Descriptor, date					
French Name	French Name					
Synonymy	Synonymy					
Object Detail	Object Detail					
Family	Family	SubFamily	SubFamily			
	SuperFamily	SuperFamily				
Order	Order	SubOrder	SubOrder			
	SuperOrder	SuperOrder				
Class	Class	SubClass	SubClass			
	SuperClass	SuperClass				
Phylum	Phylum	SubPhylum	SubPhylum			
Kind Fauna	<input type="checkbox"/> marine <input type="checkbox"/> terrestrial <input type="checkbox"/> freshwater <input type="checkbox"/> aquatic <input type="checkbox"/> parasite <input type="checkbox"/> fossil					
Detailed Geographic Origin	Geographic Origin			Continent	Continent	
				Country	Country	
Date of collect or purchase	Date of collect or purchase			Province, County	Province, County	
Price (when bought)	Price (when bought)			Lambert Coord.	Lambert Coord	
				UTM Coord.	UTM Coord	
Provider	Provider					
Other observations	Other observations					
CONSERVATION - STOCK		Conservation Status of the species		Conservation Status of the sp		
Conservation Mode	Conservation Mode			State of conservation	State of conservation	
Access	<input type="checkbox"/> Exposed to public <input type="checkbox"/> destroyed <input type="checkbox"/> In box <input type="checkbox"/> Not exposed <input type="checkbox"/> not found <input type="checkbox"/> other <input type="checkbox"/> no more in collection (transferred) <input type="checkbox"/> Label found alone					
Conservation Place	Conservation Place			StockMuseum	StockMuseum	
USE and PUBLICATIONS						
Reproduced as	<input type="checkbox"/> digital foto <input type="checkbox"/> colour foto <input type="checkbox"/> white & black foto <input type="checkbox"/> drawing <input type="checkbox"/> slide <input type="checkbox"/> painting					
Reproduction published in...	Reproduction published in					
Ident. by ... and when	Ident. by ... and when					
Print new label	<input type="checkbox"/> to do <input type="checkbox"/> done					
New exhibition label	<input type="checkbox"/> to do <input type="checkbox"/> done <input type="checkbox"/> to correct					Card Car

Fig. 3. Fields of the encoding card in the database. The information in the highlighted fields comes directly from the written record. All the other fields are filled in with information from other taxonomic sources and from inventories in the various storage rooms.

This database is our best tool and makes the museum a leader compared to the other museums in Belgium, where computerization of collections is only in an early phase. Recently, the government of our French-speaking Community published a "Museum" decree in December 2002 requiring computerization of the collections.

2) Diffuse Information Worldwide

We use the Internet, international meetings and journals to disseminate information. The museum web site was created at the end of 1996 by a student group as a practical exercise in multimedia training. The site address has been accessible on the net since January 1997. It presents an introduction to the public exhibition rooms and collections and historical information.² It is enriched periodically with new pages of information. One of the goals of the site is to provide information about collection content, but database access is not yet functional.

Another means of information dissemination is to attend national and international conferences³ and present posters or oral communications about our collections. This only has been effective since 2000 (due to improvement of the database), but few conferences are organized on the topic of collections. Some papers were published on specimens or taxonomic revision through these conferences (Loneux 2002a, 2002b, 2002c, 2003; Loneux & Thiery 1998; Loneux & Walravens 1998, 2002).

3) Welcome Specialists for Studies on the Material

All people interested in collections are welcome. We are not able to pay for the travel of researchers, thus we are visited by few foreign specialists. We succeeded once, however, in helping a Russian specialist obtain a grant from our Belgian Commissariat for International Relations. Tina Molodtsova stayed two months during autumn 1999 to review the Cerianthida-type material studied by Van Beneden.

We also loan material for study, if feasible. Specimens are sent to researchers, or they come to borrow them. Researchers publishing results are invited to send a copy of their paper to the museum.⁴

Regarding the UMAC 2003 Theme: "Engaging the Community"

We welcome students from high schools (pre-university) for practical exercises using the Museum collections. Future multimedia graduates (5 students) and future librarians (7 students) contributed to the enrichment of the web site and the digital documentation of specimens. For example, the temporary exhibitions that we produced have been put on the web after the exhibition: one page presents the common or curious spiders from West Europe (in French only).⁵ Another

page presents the common arthropods found in houses (in French only).⁶ We have many ideas for further development.

I developed the practical part of my lectures in Entomology (15h + 15h) using the entomology collections. Five students in 2003 have worked either to prepare an exhibition box concerning a group of insects or a theme, or to enter database information on a single insect specimen from an entomological donation.

Every Friday evening since January 2001, I have organized weekly free practical workshops on osteology and entomology for any student or adult volunteers interested in collection work. Topics include washing specimens, mounting skeletons, mounting insects on pins, encoding data in the database, filling up jars with alcohol, etc. The regular participants were veterinarian students and children 8-15 years old. The children came more often during holidays. Their work allowed us to prepare some specimens requested for exhibitions outside the Museum, or simply to preserve and take care of specimens already exhibited or stored in depositories.

Since 2000, we have taken on "scientific collaborators" for the Museum. This official status, without any salary, is recognized yearly by the University for outside people introduced and recommended by a head of a unit. These collaborators agree to help with the preparation of public exhibitions, the restoration of specimens or the sharing of expertise in specimen identification, mainly in Entomology.

Although we took on students, we did not obtain any commitment from our own colleagues in the Institute. They do not seem to care about the scientific value and use of the specimens. The requests for study material come more from foreign than Belgian researchers. Most of the Belgian requests come from external people rather than from Liège University. At present, requests are received more by e-mail than by postal mail or direct visits.

Zoological Collections in Liège: Present and Future

Despite present accomplishments, the second millennium marks another change in collection use and management. The Museum's role as a showpiece is retained, but only through the permanent exhibition rooms. In 2000, the last academic director retired and the departments and research units were reorganized. The administrative direction of the museum remained suspended. In 2002, the university merged the museum with the aquarium. As a result, the separate university funding for collection care and scientific development has been lost.

Since 2001, two sources of revenue have been renting specimens requested for outside exhibitions, and my entomological identifications and expert appraisals.

The income was large enough in 2003 to cover the costs of preservation alcohol and care against insect pests, and fund attendance costs for the UMAC conference in Norman, Oklahoma, USA, and the European Bird Collections Conference in Leiden, NL. Participation in previous UMAC conferences, however, was not possible.

In the future, one curator will be appointed in January 2004, for both the Aquarium and the Zoological Museum. The job description is completely different. Combining the curatorships is a substantial savings for the University, which has stated that dead collections would not need someone to care for them and could wait. The live fish and public engagement are considered to be more important than the scientific heritage, so the one curator will be the actual Aquarium curator. The last museum technician has been encouraged to go into early retirement (but without success so far), and my job has been eliminated.

It seems clear that I have not succeeded in involving the community, even if I have good support of the ones I have engaged. The actions and accomplishments presented here have not elicited enough community attention as far as the decision-makers were concerned. I did "engage communities," but not the strategic ones and definitely not enough, even if I spent more than a strict half-time job pursuing those goals. Valorizing heritage ought to involve promoting yourself and your job to the decision-makers and scientific community within your own university. The real future of collection management and scientific valorization is still unknown.

As the University of Liège does not allow appropriate scientific collection maintenance and development, through its limiting of staff and resources devoted to zoological museum collection care and research, the part of the collections not used for public exhibition should be entrusted to conservation institutions that can focus on specimens and collections, such as the Royal Institute of Natural Sciences in Brussels, The Royal Africa Museum in Tervueren and the Entomological Conservatory of the University of Gembloux. In this way, the University would demonstrate its willingness to preserve the scientific value of these collections. Another possibility is that the 2004 vacancy in Animal Systematics will be given to a researcher with a particular interest in collections-based research, who is ready to develop the zoological museum resources, as well. On the 21st of January, 2004, the Rector announced the creation of a vast Science Museum project to be installed in the Zoological Institute and its surrounds, without elaborating further.

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Notes

¹ The author was an assistant acting as Curator at the University of Liège zoological museum from 1991-2003.

² The museum web site is accessible through <http://www.ulg.ac.be/museezoo>.

³ Conferences such as: 1st World Congress on Conservation and Preservation of Natural History Collections, Madrid (Spain), May 1992; 2nd World Congress on Conservation and Preservation of Natural History Collections, Cambridge (UK), August 1996; 2nd European Crustacean Conference, Liège, Sept. 1996; 7th Entomological meeting of Gembloux, Gembloux (Belgium), October 2, 2000; Symposium "Status and trends of the Belgian Fauna with a particular emphasis on alien species," Royal Belgian Institute of Natural Sciences, Brussels (Belgium), December 14, 2001; 23rd IOC 2002 International Ornithological Congress, Beijing (China), August 2002; "The Colour of Ocean Data," International Symposium on oceanographic data and information management with special attention to biological data, Brussels, November 25-27, 2002; 8th Entomological meeting of Gembloux, Gembloux, December 18, 2002; UMAC 2003 3rd Conference on University Museum And Collections, Norman, OK (USA), September 21-26, 2003; 3rd Conference on Bird Collections, Leiden, October 2003.

⁴ Examples include d'Udekem 1997; Lays 1997; Molodtsova 2001; Reiling 1998, 2000, 2002; Thiéry 1996; Tomasovic 2000; Wasson 1996.

⁵ Accessible through <http://www.ulg.ac.be/museezoo/ara>.

⁶ Accessible through <http://www.ulg.ac.be/museezoo/arthro>.

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UNLOCKING THE LEGACY OF ALBERTA'S NATURAL SCIENCE COLLECTIONS

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Abstract

Alberta's natural science collections face fundamental challenges that are part of much larger issues beyond museums and collections. University collections can thrive in the midst of these challenges by focusing on a simple theme: unlocking the legacy of our collections. This paper describes our dreams, our strategies and our progress in unlocking that legacy by building a distributed computer network that provides access to information about natural science collections objects in the province of Alberta. Knowledge summaries that act as intellectual roadmaps enhance access to basic specimen databases. A vital community of collections users energizes the network. Our aim is to build a virtual facility, for all public natural science collections in Alberta, that nurtures a dynamic, sustainable and mutually supportive balance among objects, ideas and people at multiple levels.

The Challenge of Museum Community Identity

Numerous evolving societal currents and constraints influence museums and collections in the Canadian province of Alberta. The range and interwoven complexity of these forces challenge the sustainability of museums through the changing identity, nature, and interactions of the communities that collections serve.

The diversity and ambiguity of museum communities becomes a concern when the connection between the users and the financial support of a collection is tenuous. Although collection use may be extensive, and the act of studying a collection almost always adds significant value to it, that added value may not contribute to the upkeep of the collection. Users also may be unaware that particular specimens exist, or may not be able to sort through myriad objects physically. An obvious solution to these problems is to make primary accession data on collections objects widely available online, using a medium that is ideally suited to serving diffuse and difficult-to-define communities. Serving these communities more effectively also allows them to coordinate, consolidate and connect with funding sources.

Collections supporters are not only researchers or even curious observers, but people who are attracted to the sense of time, place and the flow of history that collections impart. For these people, collections often play a key role in anchoring community identity in a multidimensional world. They house tangible touchstones and associated information that root community ideas and allow recourse to fact-based knowledge. Thus, museums and collections can help to define and create communities, as well as the reverse. But unless museums are accessible to the communities that support them, the link between people, objects and ideas will break, and it will be extremely difficult to rebuild.

The continual fragmentation and recombination of university departments and the governments or private institutions that house collections is part of the challenge of community identity. Substantial portions of collections may be unrecorded or become disorganized, and the founders who built these valuable research and teaching resources inevitably retire, sometimes without replacement. In some cases, administrative policies shift toward short-term cost recovery, jeopardizing collections that currently receive little use, but nonetheless have enormous value as long-term records of the natural history of a region. Enhanced communication and data sharing potentially can assist collections that are struggling. This is accomplished through mobilizing community support or by enhancing visibility in ways that would have been impossible without advances in computer technology and the advantages of scale provided by a larger network of collections.

Even the relationship of Albertan people with the natural world is changing rapidly. With increasing urbanization and the need to keep our footing in a maelstrom of online information and new technology, we seem to have little time left to maintain familiarity with the little things that compose our natural world. Our loss of familiarity with our natural surroundings creates a deficit in the environmental literacy that is needed to make responsible decisions about issues such as global climate change and ecological services. Museums always have served as windows to our larger natural world. Our challenge now is to provide portals that ensure that new generations will take the time to understand nature better. Paradoxically, our approach is to use computer technology to mitigate the alienation from the natural world that is due, in part, to overreliance on computer technology.

Despite, and because of, these larger challenges, there has been an increase in requests and opportunities to access collections data. Rapid access to baseline data on biodiversity and climate change indicators feeds

into more effective land and resource management. New opportunities and innovations with computing technology are arising continually in pattern recognition, data mining and wireless communication. Information access and sharing between remote communities is possible on an unprecedented scale. Furthermore, in Alberta, the timing for our project is urgent, because it transfers knowledge from a large cohort of curators who have retired recently or are nearing retirement, and appropriate, because the province of Alberta and the University of Alberta celebrate their centennials in 2005 and 2008, respectively.

Goals and Strategies

To meet the challenges of our changing communities, institutions and environment, we are proposing to build a facility that will encompass all public natural science collections in Alberta. The Alberta Natural Science Collections Information Facility (ANSCIF) will digitize, database and harmonize more than a century's worth of natural science collections information into a searchable web-based record of natural heritage. This resource will form the foundation of a community of researchers, naturalists and educators throughout Alberta, with strong integration across Canada and internationally. The facility will include all recognized collections of biodiversity or earth science objects at institutions across the province, whether educational (Olds College and the Universities of Lethbridge, Calgary and Alberta), provincial (Provincial Museum of Alberta, Royal Tyrrell Museum, Glenbow Museum and Alberta Research Council), or federal (Canadian Forest Service, Agriculture and Agri-Food Canada and Parks Canada). The distributed virtual museum at the University of Alberta¹ has served as a successful pilot project.

The ultimate goals of ANSCIF are to unite the rich natural science data resources of all participating institutions, and to act as an interface linking people (researchers, curators, students, teachers, naturalists, environmental consultants and members of the public), institutions (universities, colleges, museums, industry), and computational resources (hardware, software, enhanced content).

We hope to accomplish our goals within five years with funding applications now under review by both the Canadian Foundation for Innovation and the Alberta Science and Research Investments Program. To achieve these goals, ANSCIF partner institutions will determine and confirm key management principles, under a general Memorandum of Understanding (MOU) that formally outlines governance and collaborative team structure (Fig. 1). The MOU also will recognize that data ownership resides with publishing institutions, and it will summarize the key objectives of the facility. Prior to final approval of funding, the MOU will

articulate collaborative resource sharing principles. A comprehensive internal and external communications plan will be developed, including a regular E-mail bulletin, manuals, guidelines and an annual meeting for participants.

1. Networked Databases

Foundation databases of collection objects will be the building blocks of ANSCIF. We will create a comprehensive network of databases containing collection object information for natural science collections across Alberta. Although our pilot projects at the University of Alberta currently use MultiMimsy, ANSCIF will be platform-independent and will support the use of widespread database products, such as Access, FileMaker Pro and SQL Server. Individual databases are to be housed and managed by each participating institution.

All data entries are to be anchored to individually-identified specimens curated at each institution. Each institution will be responsible for cataloguing its own collections (generally onsite) in accordance with international standards and practices of collections documentation. The pace of databasing will vary depending on the kind of specimen object (e.g., herbarium sheets will be slower than pinned insects, because more information is recorded). Quality control of data entry will be the responsibility of the curator or collection representative, with quality oversight provided by standards and evaluation subcommittees. ANSCIF will contribute to initial training and coordination of data entry technicians.

Most specimen text information will be digitized manually, but some collections may explore data entry by voice recognition and optical character recognition. Digitization of specimens may be performed to different extents and in different ways for each collection. For example, high quality two-dimensional image scans are most appropriate for pressed vascular plants, whereas three-dimensional reconstructions may be more suitable for large animal fossils.

Databases will be constructed in a manner compatible with system-wide data querying using agreed-upon metadata (data structure) standards, such as Darwin Core V2 and georeferencing guidelines such as those outlined by Global Biodiversity Information Facility (GBIF). Specific programs, processes or hardware will not otherwise be mandated. Unique and enhanced features among collections and databases will be encouraged.

2. Knowledge Summaries

Enhanced knowledge summaries for collections data and objects will be created as an integral part of ANSCIF, including species and geological type pages. Their design will allow rapid intellectual access to significant collection contents. ANSCIF participants will

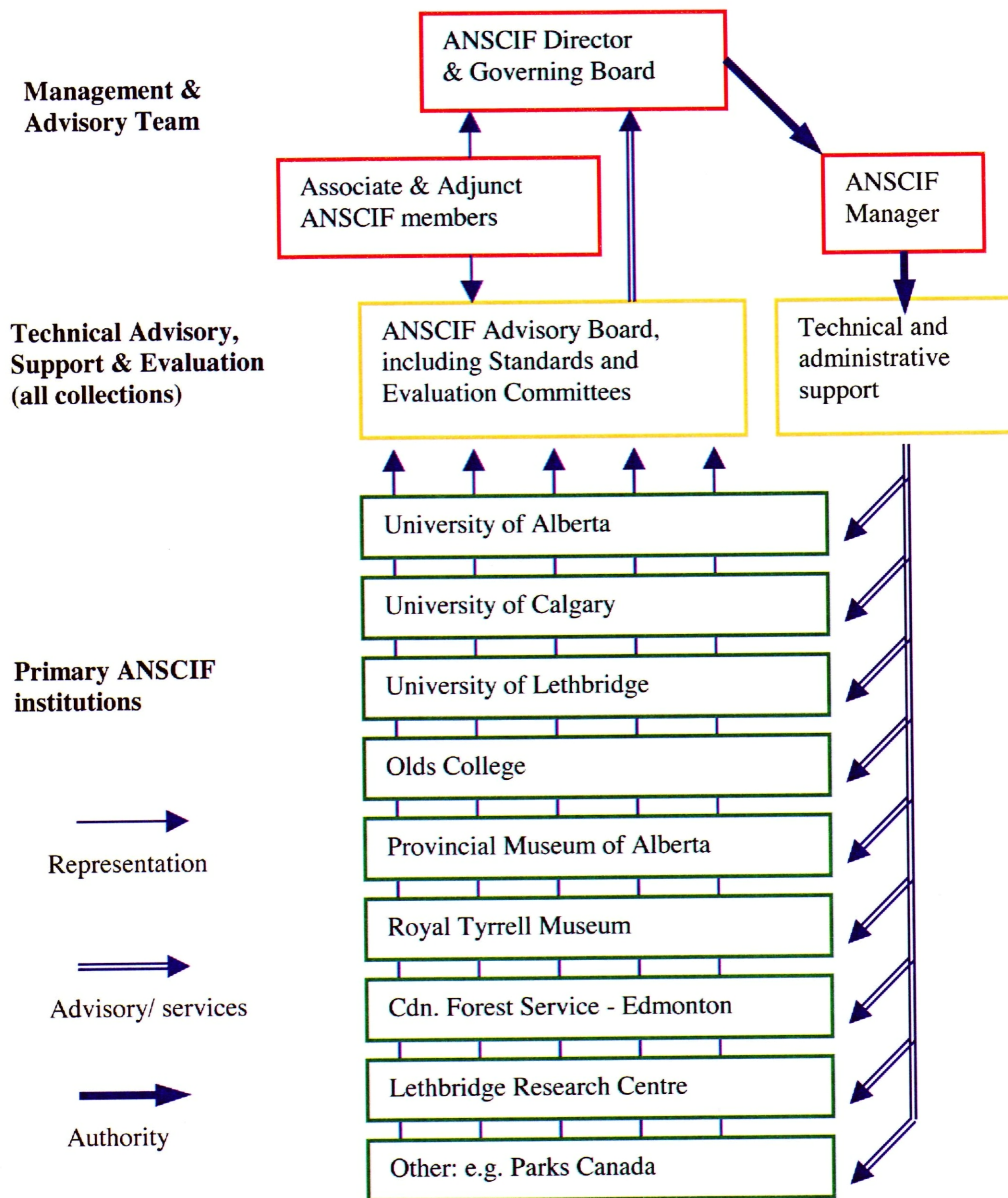


Fig. 1. Proposed ANSCIF management structure. An individual curator may serve in one or more of the following capacities: 1) Governing Board, as the Institutional Representative, and/or; 2) Advisory Board, in one or more Standards and Evaluation Committees, or as a Collection Representative. Persons representing Associate or Adjunct ANSCIF member institutions serve on one or more Standards and Evaluation Committees (SECs) and may be members of the Governing Board. SECs will include all relevant curatorial representatives in the following disciplinary groups: 1) computing networks, 2) botany and mycology, 3) entomology, 4) invertebrates, 5) vertebrates, 6) palaeontology, 7) geology, 8) anthropology (not including human artefacts).

contribute to the production of knowledge summaries within their relevant disciplines. Knowledge summaries provide authoritative information (e.g., geographic, historical, stratigraphic, taxonomic, genetic) on a biological species or a class of earth science objects. They are comparable to naturalist field guides, but are updated continually from the entire ANSCIF network and may be tailored to meet individual user requirements. For an example of a knowledge summary for one University of Alberta collection, see the sample butterfly species page from the E.H. Strickland Entomological Museum (Fig. 2).

Knowledge summaries will be housed in a central repository, but will be created and modified locally. Participation by emeritus academics and senior naturalists will be critical for producing effective knowledge summaries to crystallize for future generations the experience and understanding of our current generation. Authors, editors, reviewers and revisers of species pages or equivalent knowledge summaries will be given credit and responsibility for their individual contributions. Knowledge summaries and associated images can be the copyright of the authors responsible for them, or they may be copyrighted by the institution where the creator is employed, in congruence with institutional policies. The same staff who curate and confirm specimen identification prior to databasing will generate knowledge summaries when feasible.

Species pages will be produced for all species for which expertise is available, including vertebrates, plants, and insects and other invertebrates. We will start with economically important or charismatic groups of organisms. Similar criteria will be used to develop earth science knowledge summaries. Dynamically-generated summaries of specimen information (high quality tables and maps) will be created for all identified species and earth science object classes.

Summary information will be derived from, and linked back to, individual specimens that are physically housed at ANSCIF institutions. Knowledge summaries will include digitized specimen images. General formats for knowledge summaries will be developed in tandem with procedural and metadata standards that will dictate which data fields may be included to best describe a species or an earth science object, and how ANSCIF-wide information should be summarized graphically.

3. Internet Access

The most efficient means for achieving the goal of uniting the natural science data resources of participating institutions is through the creation of a distributed network that is openly accessible and searchable over the Internet. The ANSCIF network will be an interoperable system of natural science databases and information repositories with a computational architecture that uses a Web Services model.² ANSCIF programs will be based on general web standards

set by such organizations as the World Wide Web Consortium (W3C). Natural science-specific standards, such as those of the Taxonomic Database Working Group, will also be met to ensure interoperability with regional informational networks that are not necessarily specimen-based, such as the Alberta Natural Heritage Information Centre (ANHIC), the Biodiversity Species Observation Database (BSOD) and the Fish Management Information System (FMIS).

After initial development of procedural and metadata standards for the exchange of data among participants, further work will concentrate on adding and creating tools for facility-wide searching, data mining and geographic and historical modelling. Analysis may incorporate third-party analytical tools (e.g., ArcINFO). An early projected developmental step of ANSCIF will be the adoption and implementation of data exchange standards for specimen information, and optimization of interoperability with other biodiversity networks. The data exchange format will use XML (Extensible Markup Language), data exchange protocols will use SOAP (Simple Object Access Protocol) and registry services will use UDDI (Universal Description, Discovery and Integration). A central web portal will act as a gateway for ANSCIF on the web, providing a home for knowledge summaries and an overview of institution-specific features.

The existence of separate ANSCIF data nodes will be advertised actively. ANSCIF will assist in setup, training and system maintenance, but participating collections and institutions will be responsible for maintaining independent nodes. As an alternative to maintaining separate nodes, participants may collaborate with partner institutions to make their data available from a central server, either pooled with that institution or presented separately. Data ownership and the right to change previously published data will remain with the originating institutions, and specifically with the relevant curators or collection representatives. However, the University of Alberta will maintain backups of all data, in order to comply with funding agency regulations that require long-term accessibility of all data. Services and data may also be made available independently of the central portal, to enhance unique or advanced features of individual collections. Where appropriate, ANSCIF will take advantage of existing or emerging computing grids and associated technologies.

Community-wide standards and policies will guide controlled access to sensitive data (e.g., locality information for rare species). Access to basic collection object data will be free to all users of the system, but a charge may be levied for enhanced web services, such as hard-copy reproduction of species pages and associated images.

Entomology Collection

[Intro Page](#) |
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Species Page

specimen search results -> *Papilio canadensis* -> species page

scientific name *Papilio canadensis* Rothschild & Jordan

common name Canadian Tiger Swallowtail

habitat
Boreal forests and parkland aspen groves, local in the prairie grasslands.

seasonality
One brood per year, the peak flight period occurring from early June to early July.

identification
Throughout most of Alberta, there are no species that can be confused with the Canadian Tiger Swallowtail. The large size (85 - 100mm wingspan) and black stripe through the middle of the hindwing distinguish it from the Old World and Anise Swallowtails (*P. machaon* and *P. zelicaon*). In the extreme southern part of the province, from the Crowsnest region south and east to the Saskatchewan border, three other Swallowtails could be encountered that are superficially similar. The Two-tailed Swallowtail (*P. multicaudatus*) is larger (wingspan usually over 100mm), has narrower black stripes, and has two rather than one tail per hindwing. Pale or faded female *P. canadensis* are similar to the Pale Swallowtail (*P. eurymedon*), but the black stripes of *P. eurymedon* are much broader, and the ground colour of *eurymedon* is white or creamy white, never pale yellow. A third species may be present in the Waterton - Crowsnest area, the Western Tiger Swallowtail (*P. rutulus*), which has yellow rather than red spots along the margin of the hindwing underside. No subspecies are currently recognized.


life history
The eggs are smooth, green and round (Bird et al. 1995). Early instar larvae resemble bird droppings, while mature larvae are velvety green with a pair of eyespots and a yellow and black stripe on the mid-thoracic segment (Guppy & Shepard 2001). Pupae overwinter, and are light brown with a darker brown lateral stripe (Guppy & Shepard 2001). Males patrol along forest edges to search for females, often along the canopy or subcanopy of aspen woods, and sip moisture at mud and sand.

conservation
Not of concern, a widespread, usually common species.

diet info
Larvae feed on willows (*Salix* spp.), Trembling Aspen (*Populus tremuloides*) and cultivated crab apple (*Malus* spp.). Adults nectar at a wide variety of flowers, particularly dandelion (*Taraxacum officinale*), cultivated lilacs, dogbane (*Apocynum* spp.) and Labrador Tea (*Ledum groenlandicum*) (Hooper 1973).

range
The Canadian Tiger Swallowtail occurs through most of Canada and Alaska (but not in the high arctic), south to the northern tier of the U.S. (Opler 1999).

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MORE IMAGES

Related Species Info

[Authorship](#)

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[References](#)

Specimen Info
There are 42 specimens of this species in the online database

[Map Distribution](#)

[Adult Seasonal Distribution](#)

[Specimen List](#)

University of Alberta E.H. Strickland Entomological Museum

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Fig. 2. Species page example. Further information on this common butterfly in Alberta may be obtained through the *Entomology Collection* web site. This web site includes high quality images of top and bottom, full lists and data for museum specimens, references linked to the University of Alberta library system, histograms of adult seasonal flight times and searchable maps with Alberta records plotted in relation to features such as habitat types and roads.

4. Conservation of Collections

Specimen storage systems (including tissue freezers) that meet modern curatorial standards will protect all ANSCIF primary member natural science collections for future generations. Cabinets, shelves and compactors will be purchased and installed for participating collections to ensure the long-term safety of specimens and objects. Long-term storage equipment for cryostorage of DNA and tissue samples will be installed, including power backup systems, where required.

Storage systems will comply with institutional policies, legislation and regulations. These include the federal Cultural Property Import and Export Act and the National Sciences and Engineering Research Council of Canada (NSERC) "Framework for Researchers Working with University-Based Collections."³ As lead institution, the University of Alberta is designated as a Class A institution under the federal Cultural Property Act, and functions within a framework of institutionally-approved museum policies and procedures, legislation, standards of museum practice and a Board of Governors-sanctioned Collections Committee. Institutional policies on destructive sampling from specimens also may be established.

Storage equipment may be deposited on indefinite loan or given to institutions that are not the lead institution, depending on the conditions of the grant through which it was purchased.

5. Connected Communities

A key element of ANSCIF will be the empowerment of an innovative community network that sustainably supports research and training in museums and collections across Alberta. A comprehensive communications plan to be developed by ANSCIF participants will explicitly include museum information users at multiple levels. Participation of user communities will be encouraged to maximize long-term value, sustainability and growth of collections. Regular taxon-specific or collection-oriented meetings will be held in association with individual collections, and local naturalists will be recruited to assist in producing knowledge summaries. Some examples of current outreach programs combining research and training are at the University of Alberta's Department of Museums and Collections Services and the Alberta Lepidopterists' Guild.⁴

Databases will be linked to networks of biodiversity information with national nodes, including the Canadian Biodiversity Information Facility (CBIF)⁵ and the Canadian Information System for the Environment (CISE),⁶ and global nodes, such as the Global Biodiversity Information Facility (GBIF),⁷ to maximize opportunities for broad comparisons against ANSCIF data. Extensive, accurate and locally relevant content in our publicly available databases will facilitate

lifelong learning. Broader links to heritage networks worldwide will also be maintained, including those that address museum documentation standards (e.g., the Museum Computer Network, the Canadian Heritage Information Network).

The active involvement of local naturalist groups in ANSCIF will be particularly important. For example, each collections database developed to date at the University of Alberta has incorporated an extensive volunteer system drawn from the graduate and undergraduate student population and the general public (e.g., via the Friends of the University of Alberta Museums or the Alberta Lepidopterists Guild). Volunteer activities have included species identification, specimen cataloguing, data entry and creation of species pages.

Progress and Transformations

Many challenges faced by collections are the same as those that universities deal with as educational institutions. In parallel with the companion paper by Andrews and Blondheim (*in litt.* 2004), we use a condensed list of Hanna's (2003) strategic challenges as a set of criteria for evaluating our progress in repositioning collections. Hanna describes a growing problem of relevance for higher education institutions around the world as the international economy evolves toward a global network organized around the value of knowledge. He lists several strategic challenges that are transforming colleges and universities as they meet this complex, dynamic, global environment. The University of Alberta Virtual Museum was developed independently from the analysis of Hanna, and so it is instructive to assess how accurately we have anticipated the same challenges.

A number of collections at the University of Alberta and elsewhere in Alberta have made similar transformations in serving their changing communities, but space constraints prohibit a comprehensive treatment. We focus here on a single collection, the University of Alberta Strickland Museum of Entomology, to illustrate how some of the challenges articulated in Hanna have been met. The Strickland Museum started as the research collection of E.H. Strickland, who founded the Department of Entomology at the University of Alberta in 1922. This department merged into the Department of Biological Sciences in 1994, but the museum thrives in a building that also contains the largest concentration of entomological researchers on the University of Alberta campus. With about one million specimens, the Strickland Museum is tied with the collection of the University of Manitoba as the largest insect collection in western Canada. Its largest component is beetles, representing the research interests of the Emeritus Curator, Dr. George Ball. However, one of the most active parts of the Strickland Museum is now the

Bowman Collection of moths and butterflies, reflecting the recent arrival of the senior author of this article, even though the Bowman Collection was virtually unused since its acquisition from the widow of a prominent local collector in 1955. The Bowman Collection is now one of the focal points of the Alberta Lepidopterists' Guild, a group of several dozen enthusiasts from all walks of life who have been the driving force behind the development of the entomology Virtual Museum.

1. Removing Boundaries

Until recently, the physical boundaries of collections in many campuses were almost absolute. An extreme example is the collection encountered by the senior author at a major university, where a widely respected researcher sympathetic to the collection never stepped into it in 30 years, even though his office was in the same building. The museum director justified this relationship with colleagues in terms of protecting the collection from damage and interference. Now, however, it is possible to have the best of both worlds. Digital imaging and databasing can open fundamentally important parts of collections to everyone with an Internet link, even those on the other side of the planet. The removal of the barriers that surround collections has resulted in a rapid increase in the use of our collections. At the same time, even more stringent measures can be taken to ensure the physical security of the collections objects. Theoretically, enhanced accessibility could cause the need for enhanced security; however, in practice, this concern is immaterial to our entomology collections because they have relatively little commercial value. Community members who use the collection and are familiar with it will also police "their" collection. In fact, we have found that the simple act of giving entomology museum door keys to a small group of the most trusted and enthusiastic naturalists who desire regular access to the collection has had an astonishingly positive effect on the number of hours and value of their volunteer services, with no reduction of security.

2. Supporting Entrepreneurial Efforts

At the University of Alberta, the entomology Virtual Museum system has supported entrepreneurial initiative and technological adaptations at several levels. For example, a series of small, informal agreements were made with volunteers, and contracts were awarded if funding was available, to build increments of 80-200 species pages at a time, or to database about 5000 or more specimens at a time, giving a total of 1200 species pages and 46,000 specimens databased as of November 2003. Payment and/or uploading the work of volunteers to the Internet site was linked to delivery of the completed database or set of species pages and an independent assessment of the quality of the product. This resulted in amicable negotiation at the beginning of each round, with a steady increase in

both amount and quality of the result over time. The people who did the work took considerable pride in their pages and sections of the database, which were easily identified in the "authorship" field of species pages and the "data entry" field of specimen databases, and they continued to fine-tune their work on their own time after completion. Writers of species pages and creators of images were encouraged to view the pages as drafts that would give an excellent opportunity for feedback from other naturalists, and ultimately to publish a hard copy of the species pages under their own name as a traditional regional taxonomic treatment or field guide in book form. They also were encouraged to cite their contributions in their CV as an electronic publication.

The entomology Virtual Museum also recognizes and works within the entrepreneurial culture of research. Most university collections, and the data associated with them, grow initially as targeted research collections developed by individual researchers. Larger, established collections in universities or free-standing museums grow by accretion, primarily by receiving collections after the end of researchers' careers. Good relations between collector and museum may need to be cultivated over a period of decades, as any premature attempt to acquire and incorporate a research collection into general collection will meet with fierce resistance, sometimes to the detriment of their research collection.

3. Customizing Services

The last decade has seen a major increase in business services that universities customize to allow independent styles of interaction. The search page in the entomology Virtual Museum, which began with a simple, limited design, has been updated repeatedly and made more effective. It is now possible to search by specimen, collector, date of collection, specimen number, species page, image or browse hierarchical lists of names. By providing multiple routes to arrive at the same objects and information, the site accommodates different learning styles and user requirements. Furthermore, programmers worked closely with naturalists and researchers to determine what they needed and could use. In particular, the browse function developed in response to requests by users, and its intuitive simplicity for visual searching has resulted in its becoming the preferred method of accessing information.

4. Connected and Lifelong Learning

The distributed, Internet-accessible nature of a virtual museum is suited ideally for distance and continuous learning. Contributors to the entomology site, such as naturalists and students who write species pages, often find that their participation becomes a journey of personal learning and growth. The lead author of this article requires students to write three to five species pages as a kind of term paper in a fourth-year undergraduate insect taxonomy course. This

exercise nurtures skills in accessing both old and new information about species, inferring life history or distributional information from label data, producing high quality images using digital cameras and specialized software and condensing information about species into an accurate and readable form. A substantial proportion of the student species pages have been of sufficient quality to warrant consideration for inclusion in the Virtual Museum. Students whose assignments are now publicly available are uniformly positive about producing something that is of such general utility to other users. The process of writing species pages has led students to dig into pre-twentieth century literature in university science libraries, investigate the names of obscure localities and track down their coordinates, trace the route of expeditions and ultimately to enter graduate programs. The experience has also led students to join naturalist groups, such as the Alberta Lepidopterists' Guild, which provide an excellent system of peer mentoring, joint field trips and monthly meetings inside or outside of the university.

5. Technology Training

The computer skills required to write species pages and to catalog accession information are sophisticated and useful. These skills include imaging with digital cameras, construction of composite images with multiple focal lengths using AutoMontage, image cleanup with Adobe Photoshop and library search skills (finding information on particular species and locating and deducing geographic coordinates for localities given on specimen labels). Data entry in Excel spreadsheets was encouraged for databasing, as this affords substantial logistic efficiency. An independently-programmed download utility allows the data to be entered automatically into the larger (MultiMimsy) database.

6. Strategic Alliances

Mutually supportive alliances with partners have made a major contribution to the development of the entomology Virtual Museum. Personnel at the Alberta Natural Heritage Information Centre (ANHIC), which is responsible for tracking species at risk as well as biodiversity inventories of prospective parks and natural areas, have provided significant amounts of databasing and species pages for the Virtual Museum. Early databasing templates were reviewed by ANHIC to ensure data field compatibility. ANHIC also has funded travel and accommodation in remote field sites for Strickland Museum and Alberta Lepidopterists' Guild members to survey locations of mutual interest. In addition to access to expertise, ANHIC has benefited from housing its voucher specimens in the Strickland Museum, and the placement of specimen data in the Virtual Museum. Specimen data from private collections of naturalists also may be made available to researchers

and the world community. In addition to cooperation resulting from the development of the ANSCIF proposal in Alberta, the Strickland Museum has strategic alliances with universities, museums and institutions in other provinces nationally and internationally, including CBIF, CISE, the Biological Survey of Canada⁸ and the Global Butterfly Information System.⁹

7. Measuring Quality

The quality of the information in the entomology Virtual Museum is measured in a variety of integrated ways. First, teamwork between student databasers and taxonomic experts, coupled with peer review of species pages, facilitates quality control of data. Second, utilities for building knowledge summaries, such as phenology histograms and dot maps of collection records, make it much easier to detect outlier data points. Third, naturalist groups and societies create conditions that foster motivation (though pride and even competitiveness) and the continual opportunity to improve quality through training. Fourth, easy options are given for feedback or reporting of errors via the web by listing contact people. Finally, upon funding of the larger ANSCIF project, standards and evaluation committees that are built into the governing structure will have as their mandate discipline-specific and ongoing evaluation of data quality. Most fundamentally, a clear trail that indicates who did what ensures quality in the Virtual Museum, and this encourages the assignment of both credit (and motivation) as well as a sense of responsibility.

8. Open Decision Making

Development of the entomology Virtual Museum has involved active communication over four years between a naturalist (G. Anweiler),¹⁰ an assistant curator (D. Shpeley), a programmer (J. Whittome and also later V. Gatnicki) and a researcher (F. Sperling). Furthermore, many decisions on species page format as well as the specimen database were referred for discussion to the Alberta Lepidopterists' Guild, and advice was sought internationally. Development of ANSCIF involved a grant preparation committee of four people (the first four authors of this article), and an advisory committee consisting of a dozen people, including senior, retired administrators, the Executive Director of MACS, new researchers and department representatives. Meetings or phone conversations with other institutions occurred on an extended bilateral basis. Thus, broad representation and open decision making has been essential to the progression of both the entomology Virtual Museum and the ANSCIF proposal. Regardless of the outcome of our current funding proposals, the exercise of bringing together numerous curators, collection users and institutions has succeeded in building visibility and support for collections.

Territories, Motivation and Scale

Survival is a dynamic balance, whether it refers to individuals, institutions or civilizations, and it depends on an organizational structure that allows component modules to be stronger together than when in isolation. With the Virtual Museum pilot projects and with the ANSCIF proposal, we are confident that we have a model that allows effective integration across collections while simultaneously strengthening each separate collection. By being sensitive to preexisting jurisdictions and constituencies of the institutions that contain collections, we have supported the varied motivations that underlie the creation, curation and control of collections, regardless of scale. Our aim is not perfection, since that is a futile illusion in a changing world, but rather to survive and thrive in turbulent times, and to serve as a model for other projects to follow under similar circumstances.

The shared vision of ANSCIF is to build a sustainable, dynamic network that highlights the value of our collections to the world, and enhances their use and management. To realize that vision, we have focused on unlocking the legacy of the inherent historical and scientific value of our collections for future Albertans.

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Museum was funded in part by the National Sciences and Engineering Research Council of Canada (operating grant to F. Sperling), Young Canada Works, Friends of the University of Alberta Museums and the University of Alberta (Museums and Collections Services and Biological Sciences).

Notes

¹ The University of Alberta Virtual Museum may be accessed through *Dig Into Our Collections*.

² An overview of Web Services is available through the corresponding entry in the *Webopedia Online Dictionary*.

³ See Framework for Researchers.

⁴ For greater detail, see the *University of Alberta Department of Museums and Collections Services* web site and Pohl.

⁵ See the *Canadian Biodiversity Information Facility (CBIF)* web site.

⁶ See the *Canadian Information System for the Environment (CISE)* web site.

⁷ See the *Global Biodiversity Information Facility (GBIF)* web site.

⁸ See the *Biological Survey of Canada's* web site. This is part of the Canadian Museum of Nature.

⁹ See the *Global Butterfly Information System (GloBIS)* web site.

¹⁰ See Fig. 3.

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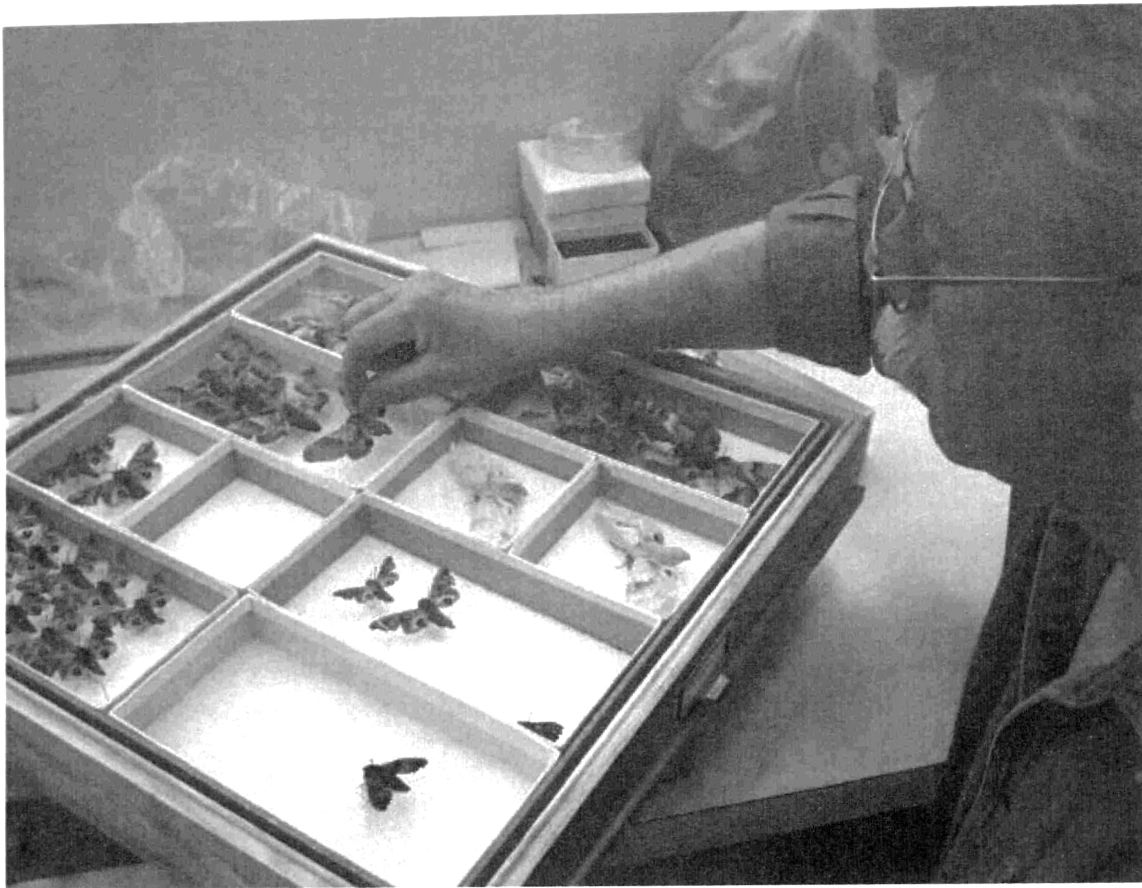


Fig. 3. Gary Anweiler, naturalist and volunteer in the Strickland Museum of Entomology, curates moth specimens. Photograph by author.

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GOING THE DISTANCE: A MODEL FOR MEANINGFUL OUTREACH

Susan Moldenhauer, Director and Chief Curator, University of Wyoming Art Museum, Laramie, Wyoming,
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Abstract

As the only four-year academic institution in the geographically large and rural state of Wyoming (WY), the University of Wyoming Art Museum (UWAM) was challenged to create meaningful access to the museum and its collection statewide. Launched in 1982, the Ann Simpson Artmobile Program (Artmobile) is a vital outreach component of the UWAM and the University of Wyoming (UW). In this paper, I will discuss how the program is organized and funded as well as recent enhancements that are effectively addressing K-12 curricular support, community access and promotion for the UWAM and UW. I also will indicate how this program may serve as an example or model for other institutions in North America or elsewhere that wish to provide outreach to rural and distant communities.

Established in 1972, the UWAM was created to assemble a collection of original art for UW to support academic programs and enrich the state's cultural environment. Today, the UWAM is housed in the Centennial Complex (Fig. 1) and shares the facility with the American Heritage Center, an archives collection. Both institutions relocated to the new building designed by Antoine Predock in 1993.

The UWAM occupies 50,000 square feet, has 7000 objects in its collections, annually presents 20 exhibitions in-house and has an active K-12 program. Visiting artists and scholars enhance educational opportunities for both the academic community and the public. The UWAM operates with nine full-time staff members: 12-15 interns, work-study students and part-time paid staff; 20 docents; and a National Advisory Board of up to 40 members.

The UWAM's mission is "to collect, preserve, exhibit, and interpret a broad spectrum of visual arts of the highest quality and of national importance for this and future generations" in order to

Support the university's academic mission by promoting education, awareness, and an understanding of the arts and its importance in our culture to students, citizens of Laramie, the populations of WY and visitors to the state and the Mountain Plains region. (University of Wyoming Art Museum 1999)

It is the only museum in the state of WY to embrace the diversity of art of all periods and cultures.

The geography and demographics of WY, which has a population of less than 500,000 people scattered over 97,914 square miles, offer interesting challenges for the state's only university and the UWAM. UW has almost 13,000 students and is located in Laramie, a city in southeastern WY of 27,204 people (U.S. Bureau of Census 2002). Winters are long, and snow may fall from September until early June. Travel is often difficult.

UW's mission identifies the "responsible stewardship of our cultural, historical, and natural

resources" as an essential goal and makes a commitment "to outreach and service that extends our human talent and technological capacity to serve people in our communities, state, nation, and world." The Artmobile is one of UW's premier outreach programs and is the subject of this paper. I will focus on the following aspects of this program:

1. how the program is organized and presented
2. how the program is funded
3. how the program supports K-12 art education
4. how recent enhancements are expanding the UWAM's connection to communities
5. how it promotes the UW and the UWAM

The Artmobile is designed to bring the museum to WY's remotest communities. A specially-equipped van transports an exhibition of original art. The Artmobile curator schedules the program, transports and sets up the exhibition and conducts tours and hands-on activities with students (Fig. 2) and a variety of other constituencies. There is no fee to the hosting institution. Only overnight accommodations for the curator and a secure area for exhibition setup are required.

Composed of about 24 objects, the Artmobile exhibition changes every two years. The current exhibition, *From Beadwork to Bronze: Celebrating Wyoming's Diverse Heritage in Art*, was designed to present diversity not only in terms of WY's often-overlooked multicultural history, but also through a wide range of artistic media, including both historic works from the UWAM collection and those by WY artists. Examples of artwork from WY artists include a pair of beaded moccasins by Eva McAdams, a Shoshone regalia maker from Fort Washakie recognized as a National Heritage Fellow by the National Endowment for the Arts; a drawing about the symbolism of food in Jewish culture by Amy Lynn Davis of Laramie; a vibrant, monochromatic red painting of a horse by John Giarrizzo of Powell; a trilogy of video shorts exploring Indian culture by Pravina Gondalia of Cheyenne; a landscape photograph by Paul Ng of Rock Springs; an

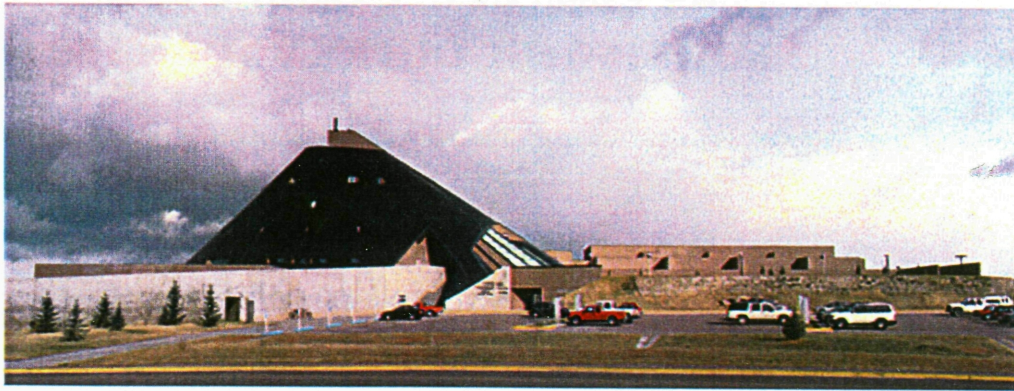


Fig. 1. The University of Wyoming Art Museum. The Centennial Complex houses the University of Wyoming Art Museum and the American Heritage Center. Photograph copyright the University of Wyoming Art Museum, Laramie, WY.

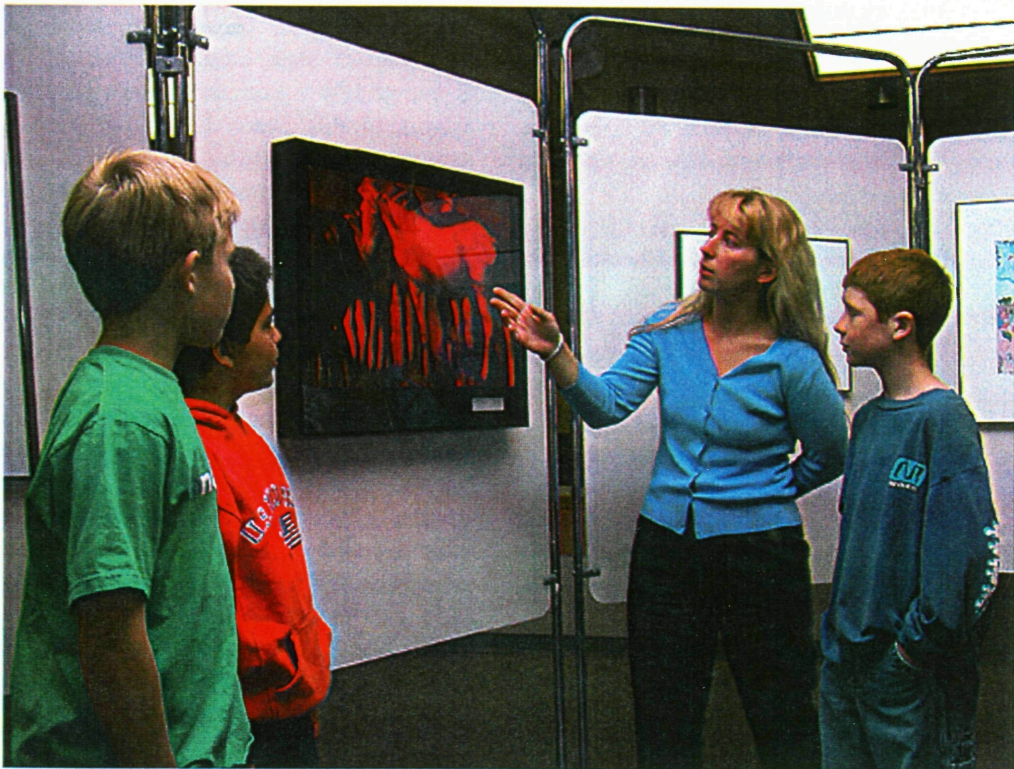


Fig. 2. The Artmobile on location in Powell, WY. Ann Simpson Artmobile Curator Jennifer Durer discusses John Giarrizzo's painting, "Red Desert: Crimson," with students in Powell, WY. Photograph copyright The Powell Tribune, Powell, WY: Toby Bonner, photographer.

ink drawing of bamboo by Sumiko O'Hashi of Laramie; a painting of a buffalo by Ridge Bear of the Wind River Reservation; a color photograph of a migrant worker in Wyoming's beet fields by Devendra Shrikhande of Cody; and a bronze sculpture of a cowboy on horseback by Michael Thomas of Buffalo. Works from the UWAM include a set of Crow leggings for a child; a vintage photograph of an Indian Lodge at Fort Washakie by J.E. Stimson; a photogravure of an Arapaho boy by Edward S. Curtis; and an etching depicting a wagon train on the Oregon Trail by Hans Kleiber.

Participants have responded well to this breadth of media, such as a 6th grade instructor from Casper (pop. 49,644) who said that the

Curator gave us a super orientation on several different art forms. Most of our students hadn't thought of beading and video as art forms. Exposing kids to new experiences opens doors to learning opportunities. (*in litt.* 29.04.2003).

A 2nd grade teacher from Sundance (pop. 1161) also addressed the multidisciplinary nature of the exhibition by commenting that the experience was "very valuable! Many pictures tied in nicely with our quilt patterns we study in second grade. The quilts tie in with patterns in all subject areas and vocabulary" (*in litt.* 29.04.2003). A 5th grade teacher in Powell (pop. 5373) in northwestern WY stated that "the exhibit was an excellent use of classroom time, and I wish we could have more experiences of this type" (*in litt.* 09.09.2003). Including WY artists has also been valuable, as a 2nd grade teacher in Sundance reported: "I enjoyed the fact that all of the artists were from Wyoming. It made it seem a little more likely to [the students] that they could become artists as well" (*in litt.* 29.04.2003).

Since its inception, the Artmobile has served an important role in supporting WY's K-12 curriculum (Fig. 3). Art education in WY's schools varies dramatically. For some, the Artmobile is the only art education opportunity their students have. For others, it enhances existing curriculum. The Artmobile is designed to be flexible to accommodate the needs of hosting schools and serve all grade levels. WY's recently adopted Fine and Performing Art Standards establish a new set of art education guidelines that will be incorporated in the Artmobile and its future use statewide.

In addition to primary and secondary institutions, the Artmobile serves a variety of constituencies, including the Migrant School for children of migrant farm workers, the Wind River Reservation, the Girls and Boys homes, Libraries, the Wyoming Women's Correctional Facility in Lusk and, more recently, state parks and historic sites. Annually, the Artmobile visits 28 venues on average, and more than 5000 students, residents and tourists participate.

The Artmobile regularly monitors feedback through written evaluations distributed at each location visited, as well as onsite and follow-up conversations

with participants. Valuable information is gained from students, art teachers, classroom teachers, principals, superintendents, librarians, state park staff and others, depending on whether the venue was a school, library, state park visitor center, senior center or other location. Because of the ever-changing nature of the audience, which can vary widely during the course of a single day, evaluations are a critical means of improving the Artmobile, especially in terms of adjusting presentations and hands-on activities to serve the needs of each audience.

A recent evaluation from a 6th grade classroom teacher in Sundance, which is located in the northeastern part of WY, supports the goal at the core of the program to bring art to audiences who otherwise would not be able to see museum-quality works of art:

It is wonderful to have "culture" brought to our corner of the state! The students enjoyed the last Artmobile visit and were excited to go to this one. They were not disappointed. (*in litt.* 29.04.2003)

A 1st grade teacher from Casper responded to whether the experience was worthwhile for her and her students by stating: "Yes—a good experience to be exposed to any kind of art" (*in litt.* 15.04.2003).

The Artmobile operates on an annual budget of \$30,000. Historically, the vehicle is replaced every ten years. In 2003, a new van was purchased through funding from the McMurry Foundation and FMC Corporation. The program is funded by private contributions, the WY Arts Council Underserved Grant and by funds generated from the Artmobile Endowment and the Julianne Michel Foundation.

In 2003, the Artmobile took on a new initiative of "bringing art to communities." Evening open houses for the public, hosted by a museum board member, the UW Outreach School or a local business, now often occur in conjunction with the schedule. Parents and the public are invited to a reception to visit and tour the exhibition with the curator. We also have incorporated the Artmobile into statewide receptions that promote the UW and the UWAM. Hosted by a board member or other friend of the UWAM and generally held in a private home, a brief program is presented and the UW's President or Vice President of Academic Affairs often participates.

In conclusion, the Artmobile is a proven outreach program that effectively engages our statewide, geographically-distant communities. Its distinctive qualities are that a museum educator is onsite with the exhibition; the program can be tailored specifically to the host venue; the cost to the host is minimal; and it is an effective promotional tool for the UWAM and UW. The Artmobile addresses needs that arise from features of WY, such as a large geographical expanse, isolated communities and limited access to museums—factors that are very applicable to other states and countries around the world. The potential for meaningful and



Fig. 3. The Artmobile on location in Powell, WY. Students in Powell, WY, discuss Martin Saldana's colorful naïve painting, "Fish." Photograph copyright The Powell Tribune, Powell, WY: Toby Bonner, photographer.

relevant experiences for rural populations makes the Artmobile an ideal model for other institutions with similar geographical situations and audience constituencies. In its galleries in Laramie, the UWAM presents objects from around the world, and the Artmobile in turn brings that world to the rest of WY.

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THE GHENT UNIVERSITY ZOOLOGY MUSEUM: A STRUGGLE FOR LIFE

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Abstract

Modern society is characterized by wide ranging ideas on many different topics. This can be reflected in the manner university governments treat their university museums. At the University of Ghent Zoology Museum, we aim to provide the most diverse range of exhibitions and events possible for a non-university public, thus involving the community with our museum. This, in combination with collaborative exhibits with other institutions, means that our University government can no longer ignore us. This is an important benchmark, and as a result, the Ghent University administration is starting to develop our own University Museum Policy.

Introduction

To my public I am known as an animated, vivid guide with an inspiring way of thinking. To the university government I am a too-talkative, tenacious pit-bull who perhaps should be put out of it's misery. How did this situation come about? What can one do to remedy it?

Our museum started off as two different collections with the inauguration of the Ghent University in 1817. A Dutch law of 1816¹ dictated that any academic institution needed to keep and expand natural history collections as an educational tool for the natural history, zoology and anatomy classes. For teaching purposes, our young university had to build a zoology and comparative anatomy collection. For the Zoology Collection, stuffed animals and complete specimens in formalin or alcohol were acquired. The Collection of Comparative Anatomy focused on skeletons and all internal organs and systems (dry and wet preparations). The university collections remained the focal point of research and education in Zoology and Anatomy for many decades; laboratories arrived in the academic world only after the 1870s. Professor Poelman did a lot of work on the anatomy collection and published a catalogue of Comparative Anatomy by 1868. In 1870, Professor Felix Plateau was given both the chair of Comparative Anatomy and the chair of Zoology. The two collections were combined, and Professor Plateau may be regarded as the first Director of the museum as we know it today. Until 1914, the collection and preparation of specimens was the primary focus of the museum.

World War I started a change in the museum's fortunes and future priorities. Many specimens were destroyed, taken away or even given away. This continued until after World War II. Since that time, the museum has struggled for survival and recognition. We have had to focus less on the preparation of specimens and more on the preservation of the collection.

Seven years ago, when I started as a curator, the Zoology Museum of the University of Gent was so unknown that about 70-80 percent of the people working in our own building did not know the museum existed! Even when you are known, it is often difficult

to get recognition because of inherent prejudice towards the function of museums in contemporary society. People have deeply ingrained ideas concerning the role and function of a museum. In the same way, they have traditional opinions about museum people and what they do (e.g., what a curator does and even looks like). Belgian-Flemish cartoonist/comic-book writer Marc Sleen, in his series about the hero Nero, provides a perfect illustration of the importance and impact of the general public's opinion (1998). Sleen depicts a museum guard asleep on the job with a newspaper closed in his pocket and slippers on his feet. The curator also is depicted as so overweight that the top of his desk has been cut away to fit his belly. Even I started slimming down after seeing this drawing (I eventually ended up losing about 20 pounds).

So, it is not difficult to understand that such attitude and prejudice may exist in our University governments. They preferred to close us down, give no extra personal and under-appreciate the present personnel. The financial under-appreciation of university museum personnel was also noted by Ing-Marie Munktel as being a distinct problem at the Museum Gustavianum of the Uppsala University in Sweden (*pers. com.* 2003).

Solutions

The main objective has to be to involve the community with your museum. We have to prove to the public and our governments that we are indeed interesting as well as necessary. The way to do this is to integrate actively and involve your public with your museum as much as possible. The public is the insurance for our future. Involvement of the community is one of the very few weapons, if not the only one, we have against administrative prejudice and indifference.

We also have to produce high standard scientific research results. The scientific research in university museums has to be based on the same scientific standards as other research done at the university level. To accomplish this, we first have to curate our specimens and, in particular, associated data with scientific

accuracy. This paper, however, will focus on how our university museum engages the community.

The Community in the Ghent University Zoology Museum

How can we serve and use the community to our mutual benefit? Examples from our museum's experience are given below.

Exhibitions or workshops that extend beyond the museum's traditional focus can be organized: people do not expect a concert or exhibition of arts to take place in a natural history museum. Occasionally we organize art exhibitions (paintings, photographs, sculptures) or small concerts located in the normal exhibition area. One man gave a performance with new-age sounds (music) and poetry from among the skeletons with subdued lights. You have to be inventive towards opening the museum to the public. For example, in previous years we organized a "Tasting of exotic meat and fruits" in cooperation with our University Botanical Garden. Guided tours about animals and plants we should and should not eat were followed by visitors actually tasting the animals and plants discussed during the tour. Visitors tasted snails, squid, insects, crocodile, kangaroo and the liver of Bankiva-fowl (*Gallus gallus*). That weekend, more than 400 people tasted insects in our museum. This event received news coverage as far away as Spain. One newspaper even ran the headline: "Best proof that Science is not dull" (Bleys 2002).

Challenging, staggering and even provocative information should be provided. People want to be intrigued, not bored. If, for example, you need to talk about parasites, involve humans as an example of parasitic reproduction; this works especially well when pregnant women are in your audience.

During special exhibitions, you can provide a person to do sign language, so he/she can translate your tour to the hearing-impaired.

Mounting of skeletons can be done as a public event. For example, people will be able to witness the mounting of a new elephant skeleton in our museum. Visitors simultaneously learn about the dangers of buying ivory and artefacts derived from endangered species.

Another important opportunity to consider is the acquisition of new specimens. It is important to collect some specimens with a larger than normal context (interest) than those you would collect normally. A skeleton with a culturally important context is more than just a skeleton. Our skeleton of the elephant Chamba (Fig. 1) was known to Sigourney Weaver and Gerard Depardieu. It gives an interesting story to tell beyond standard scientific information, and will appeal to a larger public. In our collections, I can identify the presence of a collection of specimens prepared by our first ever Director, Prof. Dr. Felix Plateau (son of the inventor



Fig. 1. Student volunteers at Chamba skeleton. Photograph by author.

of cinema, Prof. Dr. Joseph Plateau) of the Zoology Museum; it is a collection of Ziegler wax models and animals of the former Ghent Zoo which all tell different historic narratives. Inviting well-known VIP's always gives something for people to talk about. We had the honour of welcoming Sir David Attenborough and the Belgian royal Prince Laurent.

We organize search exercises for school groups and practical courses for schoolchildren as well as our university students. University students can come to the museum for more than the zoology classes or exercises—they also learn how to give good oral presentations and how to write scientific articles.

We give fun biodiversity quizzes to younger children (in which the parents often join in to help their children win) and even organize quizzes between families. Arts teachers come to our museum with their students to teach and sketch. We give tickets for combined guided tours of the Zoology Museum and the Botanical Garden. We cooperate with the City of Ghent in any special museum events.

Our volunteers not only help in the obvious tasks of basic scientific work, inventorying and collection care, but also in more challenging tasks. This makes their work more interesting. They are trained in how to approach specimens and how to handle and treat them (e.g., the use of gloves). They learn to work with the necessary computer programs. We encourage students to do volunteer work during their spare time. They can help dissect and process new specimens.

The Zoology Museum in the Community

We not only invite people to come to our museum, but we also take the museum to the people. We visit kindergarten classes to let the toddlers get a taste and feel of the museum (e.g., insects and hides) in our "museum on the move" program (Fig. 2). The children respond enthusiastically and develop early ideas of conservation and respect for nature. Instilling ideas about science and its value at an early age is a very important service



Fig. 2. The Zoology Museum visits the kindergarten. Photograph by author.

your university government can recognize, thus eliciting their support for your museum.

On our web site, people find practical information, scientific information and the species/specimens collection-inventory.

It always pays to visit television shows and radio programs as an expert. It gives you the opportunity to connect with many people and get them interested in visiting your museum.

Results

As previously noted, our museum had been struggling since World War I. This did not influence our current administration positively. The Museum found itself increasingly lost in the background until a few years ago when Prof. Dr. A. Coomans (Director until September 2001) decided action was required. He found that some administrators were keen on preserving our university's heritage, but that many others were not so willing to spend any funding on a so-called "bunch of stuffed animals, skeletons and entrails." Pushed, however, by Prof. Dr. E. Vermeersch, Vice-Rector of the University at that time, the board of administrators finally agreed to the appointment of a full-time curator and a small fund to help the Director preserve and maintain this heritage. Since that time, we have tried to use the community to show the University government that these collections are not outdated and are still of high interest and value to our students and the general public. The administration slowly changed their views about the importance of the University's collections and started to appreciate the many good public responses towards the Museum and the University. With the arrival of our new Director, Prof. Dr. D. Adriaens, we also established a Museum Council to expand our efforts to convince the University government of our value. The board of administration finally realized that in using these collections it had found a perfect showcase for the University in general.

With this approach, community engagement continues to increase gradually and the prejudice from the

university continues to decrease. The public is satisfied and eager to return and see what else we will come up with. Volunteers present themselves eager to assist. But most importantly, the University government can no longer ignore the growing engagement of our Museum, and hence of the University, with the community. The trigger for their change in attitude was our ability to demonstrate that the collections could be used as a tool to showcase the University in general. This helped us in such a way that the administration even started to consider formulating a University Museum Policy. Hopefully, we now can extend our current position with greater appreciation of existing museum personnel, and the appointment of more personnel and further adequate funding.

Conclusion

Whatever it takes, we have to keep on fighting against prejudice and ignorance. Whatever the odds, never lose your stamina and never surrender your passion. To maintain relevancy you need creative thinking. It is not enough to start up a new museum in a new building: 30 years from now you and your building still have to be brand-new.

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Notes

¹ Dutch law of 1816, September 25th, article 129

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UNIVERSITY MUSEUMS AND FORMATIVE EXPERIENCES IN NATURAL HISTORY

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Abstract

Many people who develop a passion for natural history report formative experiences from their youth while exploring creeks and woodlands in their local area. With the advent of the internet and increased urbanization in the western world, these opportunities now often are lost to the current generation of young people because of the pressure of alternative leisure activities and reduced geographic availability.

University science museums can have a role in fostering formative experiences by building elements of experiential learning into education programs for young visitors. This is particularly relevant to universities in a suburban or "green belt" location that preserve remnants of the original environment.

These programs also instill positive attitudes toward increasingly important issues, such as biodiversity and ecological sustainability. Some of the education programs from Macquarie University's Earth Science and Biology Museums are outlined in this context.

Introduction

Many modern museums of natural history will consider that imparting knowledge and content to their various constituent audiences is only a fraction of what they are trying to communicate. Viewing a museum of natural history as a repository, or warehouse, of scientific knowledge only grudgingly shared with an inquisitive public is an antiquated perspective reminiscent of a bygone age. This "Temple of Knowledge" model is derived from the early days of national institutions such as the British Museum of Natural History.

The focus of museums, which has shifted from collections to audiences, is documented by Kotler & Kotler (2000). While collections remain the foundation of museums, they are no longer merely the "attics of a society" (Braun & Mares 2001). Instead, they are used in proactive ways to wield influence on social issues (Butler 2000). The engagement of audiences to impart values and attitudes is now a legitimate and vital museum function.

Davis (1996) challenged natural history museums to raise awareness of an environmental ethic. For these museums, raising awareness about biodiversity and ecological sustainability is a critical issue that requires attention from curators and museum educators. In a university setting, education programs that seek to impart values and attitudes in visiting audiences about these issues have the advantage of a background framework of significant multidisciplinary scientific knowledge and expertise.

All museum educators know that it is extremely difficult to control learning through museum education programs, regardless of whether it is geared towards imparting knowledge, attitudes, values or skills. Instead, it is the role of the educator to provide many opportunities for learning, in different ways, through the thoughtful structuring of activities around the knowledge base of

the museum (Edson & Dean 1994). Understanding the social context of the audience is essential for the development of learning strategies through education programs (MacLulich 2000).

This paper focuses on the education programs of Macquarie University's two small science museums in Sydney, Australia—the Biological Sciences Museum and the Earth Sciences Museum. These are the public face of a range of scientific facilities at the University that also includes outdoor teaching areas such as the Biology Teaching Gardens, the Earth Science Gardens, the University Fauna Park and the Macquarie University Ecology Reserve.

Linking these museums with the scientific expertise of the university and applying the principles of experiential learning can produce powerful education programs with the potential to alter attitudes and values. The following sections outline the rationale behind the formulation of these education programs.

This model could be adopted and adapted by other university natural history museums, particularly those in green belt locations, to foster good community education linkages with the potential for long-lasting attitudinal outcomes.

What Makes People Passionate About Natural History?

Any museum, regardless of its focus, wants to enthuse audiences about its subject matter. Natural history museums want visitors to gain a heightened awareness and knowledge about nature and natural systems. In considering ways to engender this enthusiasm, while keeping the importance of social context clearly in mind, we need to deal with the broader issue of what makes people interested in natural history in the first place.

Anecdotal evidence suggests that people who develop a passion for natural history usually can recall some formative experience, either from their childhood or during their young adult years, that acted as a catalyst to develop their interest. It is instructive to examine these formative experiences and seek common threads. Discussions with natural history enthusiasts associated with the Department of Biological Sciences and regular visitors to the Biological Sciences Museum at Macquarie University informed the following list of the most common formative experiences:

- Reading a book
- A television experience
- A museum visit
- Listening to a speaker
- An early field experience

First, it should be noted that these results are anecdotal and not derived from a specific research investigation. A formal questionnaire seeking information about formative experiences in natural history is being developed and will be given to a sample of staff and visitors as part of Macquarie University's Museum Studies program during 2004. Secondly, the group under investigation consists largely of the demographic range of those over the age of 35. It therefore does not represent the target group for museum education programs through the university's science museums—namely, school-age children.

These cursory investigations show that, although one experience might be interpreted as of singular importance, a series of experiences as interest deepens is the key to sustaining a lifelong passion for natural history.

Books that were nominated as having a strong impact included *My Family and Other Animals* by Gerald Durrell. Television experiences included the *Life on Earth* series by David Attenborough.

Inspirational museum visits seemed always to include early visits to the Australian Museum in Sydney. This is Australia's first and preeminent natural history museum. The impact of early museum visits has been investigated elsewhere (Falk & Dierking 1997).

Inspirational speakers that had an impact on shaping attitudes included the Harvard naturalist Stephen Jay Gould and the Canadian geneticist and environmentalist David Suzuki.

Overwhelmingly, however, early field experiences consistently were nominated as having the biggest impact on interest levels by the most number of people. Typically, nature enthusiasts recall early childhood experiences exploring local woodlands and waterways. Easy access to relatively unspoiled environments was obviously a more readily available option for those who grew up 20 or 30 years ago.

This phenomenon would seem to be similar in other parts of the western world. In a recent radio interview (ABC On-line 2003), David Suzuki noted that

his childhood was a time of bonding with nature through camping and fishing excursions around Vancouver. He rated these experiences as being fundamental in developing his attitudes and interest in the natural world.

Much has been written about the power and poignancy of experiences in nature for shaping future attitudes towards nature (e.g., Smit 2000). The inspiration that the intersection of science and nature can provide is perhaps best encapsulated in these words of Carl Sagan:

In its encounter with nature, science invariably elicits a sense of reverence and awe. The very act of understanding is a celebration of joining, merging, even if on a very modest scale, with the magnificence of the Cosmos. (qtd. in Asma 2001)¹

In terms of developing cognitive frameworks, it is clear that most children appear to benefit from being outdoors. The infinite and diverse sensory qualities of the outdoor world stimulate brain development and function (Sebba 1991; Rivkin 1997). Young children especially need the broad experiential base provided by being outdoors. The knowledge they gain there is foundational to literacy and science learning. It has been argued that, unlike some childhood experiences, those related to the outside world appear to be lasting and formative (Chawla 1994). Other authors have noted that a lasting benefit is that children can and do learn to care for the environment if provided with numerous positive outdoor experiences (Carson 1998; Wilson 1996).

The Changing Social Context of Young Audiences

There are dual pressures of environmental degradation and lack of time conspiring against the children of today, inhibiting their opportunities for enjoying some of the formative outdoor experiences available to their parents and grandparents.

Increasing urbanization in the western world has meant a dramatic reduction in the availability of formative outdoor experiences for young people. The movement of people from rural and regional towns to urban settlements over the last three decades has been a highly noticeable trend associated with globalization.

Australia's population in 2001 was estimated to be 19.3 million (SoEARC 2001). The pattern of settlement is characterized by high rates of urbanization into low-density cities. Most Australians (about 60.7 percent) live in the five largest cities. Significant coastal non-metropolitan urban growth is also occurring. Over the next 10 years, the population growth rate is expected to decline slightly from 1.1 percent to 0.9 percent per annum (SoEARC 2001). The pattern of human settlement is not expected to change greatly, although urbanization is expected to increase. The five largest

cities are expected to contain 61.6 percent of Australia's population in 10 years time (SoEARC 2001). Similar patterns and trends have been documented globally.

David Suzuki noted that the places around Vancouver where he used to fish with his father have now become the victims of population growth and urban expansion:

Today when my grandchildren call me begging to take them fishing, I can't. The places still exist but the fish don't. People all around the world have similar recollections of childhood swimming holes that are now too polluted to swim in or fishing streams that are now without fish and this refutes the popular claim that—there is plenty more where that came from. (qtd. in ABC On-line 2003)

Rivkin (2000) commented on the changed nature of childhood:

Despite the benefits of outdoor experiences, and in contrast to earlier agrarian, pre-automotive times, children now spend most of their time inside buildings or vehicles. As most adult activities are indoors, so now are most children's, perhaps in large part from the need for supervision. Children seldom experience unsupervised outdoor play. Adult fears regarding traffic, firearms, kidnapping, injury, ultraviolet rays, insect-borne diseases, and pollution of various sorts lead them to keep children indoors. Additionally, especially in many urban areas, few places remain for children to play.

Leisure time that, in an earlier age, would have involved exploring the local environment is now largely consumed by a range of indoor activities. The growth of the internet and the access to computers in most western households consumes an increasing amount of time. For older children, the expansion of the education system and the demands of academic learning also reduce the opportunities for formative outdoor experiences.

The advent of the Information Age over the last two decades also has had a dramatic effect on the way young people learn. The rapid access to unbounded quantities of instantaneous information is considered a high time-consuming priority (Frاند 2000). It promotes a "Nintendo learning culture" (Watson *in litt.* 2003), where learning through problem solving is reduced to repetitive trial and error actions, thus militating other more holistic and logical learning strategies.

Open-Ended Investigations in Education Programs

In this section, the philosophy and structure of education programs through the Division of Environmental and Life Sciences museums at Macquarie University are outlined. Macquarie is in the fortunate

position of being located in a green belt region some kilometers northwest of the main urbanized hub of Sydney.

Experiential learning, involving practices of reflection, hypothesis, evaluation and problem solving (Kolb 1984), is a model for building cognitive processes that emphasises individual and group choice of strategies and self-directed outcomes. It is the process whereby knowledge is created through the transformation of experience.

Kolb's four modes of experiential learning are:

1. Concrete experience—intuitive preference to learn through direct experience that is reality-based and immediate.
2. Abstract conceptualization—preference for learning by thinking in theoretical terms.
3. Reflective observation—learning by watching
4. Active experimentation—learning by doing and judging its practical value.

In framing education programs for Macquarie's science museums, we utilize access to modified and unmodified environments on campus and incorporate as many of Kolb's modes as possible. We therefore view the campus environment as a natural extension of the museum environment.

For younger school children, this has been done by using the Biological Sciences Teaching Garden, with a focus on Mesozoic plants, to develop a "Dinosaur Walking Trail" to investigate the food of herbivorous dinosaurs (Kolb's Modes 1 & 3). This is linked with a replica of the Winton Dinosaur track-way in the Biological Sciences Museum and Jurassic fossil ferns in the Earth Sciences Museum. For slightly more advanced students, the Earth Sciences garden is used to explain biogeographic principles. The garden is divided by a pathway known as Wallace's line, which separates plants of Laurasian and Gondwanan affinities.

For senior high school students, problem solving and open-ended investigations are developed in a number of ways. The most popular program runs for an entire half-day and focuses on a biodiversity investigation of an unmodified environment on campus (Kolb's Modes 2 & 4).

Students are informed that there is a proposal for a housing development nearby and they have been hired as an environmental consultancy to undertake a biodiversity assessment of the area in question. Students then go through the following four phase investigation. The museum educator acts as a facilitator by guiding discussions on problem solving strategies but allows the students to develop their own conclusions about key methodologies and findings in the investigation.

1. Planning Discussion

Students discuss the issues involved in the task and devise a strategy for carrying out biodiversity sampling

in the area. This session is particularly useful for empowering the students as problem solvers. They are responsible for realizing the equipment and information needs to complete the task. It also allows them to explore the issue of what data means in a scientific investigation and its relevance to specific theories and hypotheses. It also reveals, at an initial stage, many simplistic preconceptions about biodiversity and the scientific method.

2. Sampling

Students are lead to the field area to sample leaf litter, investigate pre-established pit traps, test physical and chemical parameters of waterways and collect any other data that may be required. The concept of random sampling of leaf litter is one that often provides the biggest theoretical challenge. Students almost always agree that a random sampling regimen is required for an objective analysis, but few know how this should be constructed correctly.

3. Documenting Data

Students inevitably agree that for the investigation to yield a truthful result, accurate recording of information is required. In group work such as this, the individual tasks of correctly measuring environmental parameters (with a datalogger—a small handheld piece of scientific equipment that can record such variables as temperature, and Ph simultaneously) and recording sampling positions and results usually are negotiated among a number of investigators.

4. Laboratory Analysis

Samples collected in the field are brought back to the museum where they can be compared with reference specimens. Students have also employed the facilities of Macquarie University's Biotrack unit. This unit images specimens and compares them with a vast parataxonomic database of plants and animals from various local environments as an aid to identification. At the completion of this phase, students must think about their findings and consider the importance of the information revealed in the biodiversity analysis.

A New Role for Some University Natural History Museums

A cursory analysis of these Macquarie museum education programs indicates an emphasis on the following features:

1. They are open-ended and essentially driven by individual and group student curiosity.
2. They take place outdoors, providing an opportunity for formative experiences in the development of positive attitudes about issues of biodiversity and sustainability.
3. They are supported by a framework of cross-disciplinary academic knowledge typical of an

advanced and complex research and teaching organization.

4. They, therefore, provide opportunities that increasingly are denied to many young people in the modern world, as previously demonstrated.

Although there has been no quantitative research on whether these types of programs through Macquarie University's science museums actually have a measurable beneficial effect on long-term environmental behavior or understanding of environmental issues, they are well received by the participants.

There has been much research into the subject of environmental education and its relationship to improved environmental behaviors (Zelezny 1999). While most research concurs with the precept that there is widespread concern for the state of the environment and the general assumption that greater awareness through education will bring more responsible behavior, there is some debate on the best ways to achieve this.

Much of this research is constrained by specific methodologies and research questions, and has lead to variable generalizations. For example, Disinger (1982) suggests that environmental education in non-traditional settings outside the classroom is more effective than environmental education in the classroom. Others (e.g. Volk et al. 1984) argue that little change can be achieved without actively engaging students in environmental issues. Others (e.g. Dresner & Gill 1994) argue that long-term exposures, rather than short, compartmentalized experiences, are more effective.

Some researchers have argued that those who do not experience nature during their early years are at risk of becoming cynical towards environmental issues in the future (e.g. Finger 1994). As indicated previously, there is now a rapidly growing cohort of people who fall into this category. Other researchers (e.g. Schultz 2000) focus on the importance of developing empathy as the key to attitudinal change. Open-ended learning in natural environments provides a ready template for empathic experiences.

Birney (*in litt.* 1986) has documented the effects of museum-based programs and reported increased awareness of conservation issues. This would indicate that a positive influence on behavior is being generated, perhaps through some empathic connection between audience and objects. However, the process lacks the power of formative outdoor experiences in natural, unmodified environments.

The general community benefits of having areas of relatively high biodiversity in urban spaces have been outlined previously (Niemela 1999). This is clearly not possible for all campus museums. Those located in green belt regions with ready access to unmodified environments can more readily adapt the program features elaborated above. Those without easy access,

however, still can have their education programs benefit from access to modified environments (Simpson 1999).

Genoways (1999) outlined the major challenges to university museums of natural history. He concluded that recognizing education as the primary role of a campus museum was fundamental. Perhaps we can add developing positive attitudes about environmental issues to this. We need to exploit every opportunity that allows our education programs to have a positive long-term impact on visitors.

There are 36 Australian Universities listed in the 1998 report *Transforming Cinderella Collections* (University Museums Project Committee 1998). Of these, 18 could be classified as having reasonably easy access to relatively unmodified environments. Of these 18, however, only 10 list natural history collections in their care (University Museums Project Committee 1998). While no firm figures are available, it is clear that because of the fiscal pressure on the tertiary education sector (e.g. Simpson 2003), very few universities have outreach education programs for school groups. The potential of this type of education program is, in Australia at least, largely undeveloped.

In conclusion, I argue that if more widely adopted, this type of program would deliver positive community engagement seeking appropriate social goals that represent a responsible, proactive platform for the tertiary education sector. It may be argued, particularly at times of fiscal stringency, that a university's primary focus should be restricted to research and the education of undergraduate and postgraduate students. Increased scrutiny of the societal role of universities, however, should compel these institutions towards programs of civic engagement that are responsible, sustainable and capable of delivering positive long-term goals. The same social pressures are evident where corporations are urged to engage in processes that demonstrate good corporate citizenship. University museums are capable of contributing significantly to this agenda.

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Notes

¹ Asma notes that this experience of transcendence is available to everyone—even atheists.

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Who is UMAC?

International Committee for University Museums and Collections (UMAC)

UMAC is a forum for all those working in, or associated with, academic museums, galleries and collections (including herbaria and botanical gardens). UMAC is concerned with the role of collections within higher education institutions and the communities they serve. It provides its members with a forum to identify partnership opportunities concerning the resources in the collections, to share knowledge and experience, and to enhance access to the collections. The aim is to protect the heritage in the care of universities. UMAC communicates with its members through all available means throughout the year in order to deliver its aims. UMAC, when required, advises ICOM and other professional bodies on matters within its jurisdiction.

UMAC strives to:

- Clarify the role, requirements and relationships of university museums and collections with the university and its communities
- Assist the preservation of academic and cultural heritage
- Promote university museums and collections within governments and their agencies, institutes of learning, the broad museum sector, the professions, business and the population generally
- Provide advice and guidelines for those collections which are emerging, isolated, deteriorating or otherwise in need
- Facilitate international and regional collaboration to stimulate networking, partnerships and research and to initiate exchanges of artifacts, exhibitions, standards, practices and other information
- Encourage staff in charge of university collections to participate in museological training, mentorship and career development





Participants at the Third Conference of the International Committee for University Museums and Collections (UMAC), September 21 - 26, 2003, Norman, Oklahoma, USA. First row left to right (kneeling): Peter Tirrell, Andrew Simpson, Michele Loneux, Mauricio da Silva, Effy Alexakis, Leonard Janiszewski, Isidro Abano, Rhonda Davis, Connie Janiszewski, Sarah Disbrow. Second row: Chung Kyu Lee, John Klausmeyer, Ing-Marie Munktell, Bong Kang, Marie-Dominic Labelle, Sue Grosboll, Dominic Verschelde, Debra Meier, Susan Moldenhauer, Cornelia Weber, Errol Davies, Judith Schiebout, Aldona Jonaitis, Barbara Rothermel, Sue Schofield, Cythia Bettison, Janine Andrews. Third row: Lorne Render, Robin Walsh, Peter Stanbury, Edward Theriot, Joshua Gorman, Geir Soli, Karin Hagen, Panu Nykanen, Judy Diamond, Amy Harris, Ellen Censky, Kiralynne Hill, Doug Jones, Hugues Dreyse. Fourth row: Karl Van Dyke, Wendy Gram, Karl Hutterer, Marta Lourenço, Axel Christophersen, Teresa Moss, Giuseppe Monaco, Bill North, Steven de Clercq, Greg Liggett. Participants not pictured: Gary Edson, Lyndel King, Michael Mares.

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