

3-2011

Institutional Analysis of a Natural History Museum: Formation and dissemination of scientific knowledge

Lisa Herzog

DePaul University, lisabergwall@gmail.com

Follow this and additional works at: <https://via.library.depaul.edu/etd>

Recommended Citation

Herzog, Lisa, "Institutional Analysis of a Natural History Museum: Formation and dissemination of scientific knowledge" (2011). *College of Liberal Arts & Social Sciences Theses and Dissertations*. 76. <https://via.library.depaul.edu/etd/76>

This Thesis is brought to you for free and open access by the College of Liberal Arts and Social Sciences at Via Sapientiae. It has been accepted for inclusion in College of Liberal Arts & Social Sciences Theses and Dissertations by an authorized administrator of Via Sapientiae. For more information, please contact digitalservices@depaul.edu.

**Institutional Analysis of a Natural History Museum: formation and dissemination of
scientific knowledge**

A Thesis

Presented in

Partial Fulfillment of the

Requirements for the Degree of

Master of Liberal Arts and Science

In

Sociology

March, 2011

By

Lisa Herzog

Department of Sociology

College of Liberal Arts and Sciences

DePaul University

Chicago, IL

Abstract

When the canonization of scientific knowledge is considered as a point of sociological inquiry the interrelations of popular culture, commerce, and enterprise become crucial elements to understanding how forms of knowledge are produced and reproduced. Scientific knowledge is an integral part of our social world. We use it to better understand the natural processes behind global climates, health issues, ecology and biology. And yet most individuals outside the field of production are unaware of the processes behind obtaining this knowledge. Museums with research and collections are an arena for this topic. Their operations persist in influencing the selection of knowledge forming fields of study in both direct and indirect ways. In this study, The Field Museum of Natural History is used as a focal point to analyze ways in which the operation of an institution coincides and/or conflicts with scientific research. Data was collected through direct personal observation, interviews and published financial and historical records. Results from this analysis show that institutional operations within a museum persist in influencing the selection of knowledge forming fields of study in both direct and indirect ways and add to the literature on scientific knowledge.

Table of Contents

Abstract	2
List of Tables and Figures.....	4
Introduction.....	5
Institutional Analysis and scientific knowledge	
Brief overview of The Field Museum and its mission	
Literature Review.....	10
Museum Studies	11
Corporatization	
Blockbuster exhibits	
Iconization and merchandising	
Sociological Theory.....	16
Reputation and Capital	
Role Conflict	
Actor-Network	
Methodology	24
Ethnographic Data	26
The Field Museum (<i>of Natural History</i>).....	28
Correlation to Museum Studies Literature	
Corporatization	
Blockbuster exhibits	
Iconization and merchandising	
Scientific Research and Knowledge Formation	35
Accessibility	
Bridging the Gap	
The institution and the individual	
Business Enterprises.....	43
Collections and Research	
Exhibits and visitors	
Funding The Museum	
Discussion and Conclusions	53
Conflict Theory	
Actor-Network Theory	
Capital	
Museum Studies	
Final Note	
Bibliography	59
Appendices.....	63
Appendix A – Official Mission Statement of The Field Museum	
Appendix B – Field Museum Revenue Distribution for the Year 2007	
Appendix C – Additional Natural History and Other Museums Visited	
Appendix D – Cost of admissions to The Field Museum	

List of Figures and Tables

Figures

Figure 1: Field Museum annual attendance since opening (1921-2006)	30
Figure 2: 2006 Sources of revenue as percentage of whole	31
Figure 3: Field Museum monthly attendance (2006 and 1922-2006 average).....	32
Figure 4: Field Museum monthly attendance (2000 and 1922-2006 average).....	44

Tables

Table 1: Snapshots of Field Museum Administrative Structure.....	29
Table 2: Temporary Dinosaur themed Exhibits 2000-2010	42

Introduction

Once constituted, a science does not take up, with all the interconnections that are proper to it, everything that formed the discursive practice in which it appeared; nor does it dissipate – in order to condemn it to the prehistory of error, prejudice, or imagination – the knowledge that surrounds it...Knowledge is not an epistemological site that disappears in the science that supersedes it. Science (or what is offered as such) is localized in a field of knowledge and plays a role in it. A role that varies according to different discursive formations, and is modified with their mutations...

- Foucault, 1972 pp.184-85

Institutional analysis and scientific knowledge

Scientific knowledge, like antiquities, has a history of being part of the public trust. The Field Museum of Chicago is a public institution with internal research programs and extensive natural history collections that illustrates the sociological relationship between institutional practices and the formation of scientific knowledge. The scope of The Field Museum's mission provides insight to not only the relationship between the institution and the individual but also where and how scientific knowledge is disseminated to the general public. Existing literature in museum studies and sociology of scientific knowledge provides the groundwork for interpreting the operations of a natural history museum from a sociological perspective. When looking at sociological literature specifically, public museums that have been examined largely refer to *art* museums both explicitly and implicitly. While natural history museums with scientific research programs share many of the same operational struggles for funding as art museums or other non-research based public museums, due to their added function as collections based *scientific research facility*, and for the purpose of this thesis, I differentiate a museum centered on scientific research from an art museum with the distinction that *scientific* knowledge results from the scientific method (testable hypothesis yielding repeatable results) while *artistic* knowledge

comes from aesthetic opinions related to objects created for display purposes (Clifford 1993; Bourdieu 1979). Scientific knowledge is also presented to the general public as being born of and conducted with absolute objectivity.

The Field Museum holds a unique place in the arena of knowledge formation because it is actively involved with scientific research *and* disseminating knowledge to the general public through its permanent and temporary exhibitions. The stated mission of the museum focuses on acting as a public educator utilizing research, collections, exhibitions, and public learning programs¹. To accomplish these goals the museum relies on the executive administration to promote and manage funding. The goal of financial stability and the goal of unbiased scientific research often come into conflict and results in the institution participating in activities that may not always appear to hold true to the mission statement of the institution. Researchers operating within often encounter conflicts between what is necessary to maintain operations through financial support and what is in the best interest of their scientific research goals, causing the drive for scientific knowledge to be affected by strategies the institution utilizes to maintain operations. For instance, scientists must budget time for fundraising or giving private tours rather than devoting time to research. Additionally, exhibits intended to draw large audiences are selected due to increased potential for income (Alexander 1996) rather than true trends in scientific research.

In a broad sociological analysis of scientific knowledge the field of natural history museums is small, however, it can provide insight to sociologic theory and knowledge formation. This discussion revolves around a framework that includes components of museum studies literature, role conflict theory, and actor-network theory. Additionally, Bourdieu's concept of

¹ See Appendix A for the mission statement of The Field Museum in its entirety.

capital is critical to explaining and understanding issues of institutional operation. It is the intertwined and reciprocal relationships between economic, cultural and symbolic capital that are critical to the experiences encountered at The Field Museum. Rather than focus on specific research questions, this work is a broad analysis of the institution as a whole.

Brief overview of The Field Museum and its mission

Since it's founding, The Field Museum has evolved into one of the great natural history museums in the world. In this country only the American Museum of Natural History in New York and the Smithsonian in Washington D. C. compete with it in terms of size, influence, and prestige.

- Conn, 2004 p.293

Utilizing The Field Museum is appropriate for a study of this nature due to its location, size, and stature within the scientific community as is indicated by the above statement.

Visitorship to the museum averages between 1.3 and 1.5 million per year drawing people from all over the world. Through years of building upon donations and investments the endowment surpassed \$300 million in 2006². A large part of the museum's reputation is due to both its permanent and temporary exhibitions. Recent temporary exhibits include: *Real Pirates* (2009), *Mythic Creatures* (2008), and *Tutenkhamun and the Golden Age of the Pharos* (2007). Multi-million dollar permanent exhibits include *Evolving Planet*, *Underground Adventure*, *What is an Animal*, and *The Ancient Americas*. Additionally, scientific research yields funding from grants, foundations, and benefactors, and stature through scholarly publications and public recognition.

The Field Museum is an institution with many goals. It serves as a cultural institution that displays artifacts and representations of peoples from around the world as well as plant and animal life both extinct and extant. Its educational mission pertains to the exhibitions within the building, loan materials for use by teachers in classrooms, personnel who travel to schools and

² From the Field Museum of Natural History financial statement and independent audit for the year ending December 31, 2006. Since then, due to economic factors and stock market trends the museum has lost a significant portion of this sum and now totals less than \$300 million.

libraries, and a website that correlates to both exhibits and field research. The physical structure of the museum is a historic landmark building. Additionally, the museum houses world-class collections of botanical, anthropological, zoological and geological collections that number over 25 million specimens³. With ongoing research, the collections continue to grow and expand. These collections are integral to the scientific research that receives national and international recognition.

The museum was incorporated in 1893 largely due to a \$1million investment made by Marshal Field at the closing of the 1893 world's fair. As the fair came to completion many saw an opportunity to define Chicago as an international and cosmopolitan city by retaining the artifacts on display and creating a permanent museum. The museum was founded with collections and research at its core, as is reported by Edward Everett Ayer:

The subject then came up of organization. Mr. Field asked me to serve as President, which I consented to do, and told him that I wanted two things. One was that the museum should be open Sunday and Saturday free. The other was that we should get the best talent that money could secure (Nash and Feinman 2003:15).

The original location of the field museum was in the Palace of Fine Arts and is now known as the Museum of Science and Industry. The Field Museum quickly outgrew this space and a new building was constructed to accommodate its growing collections. In 1921 the new museum opened to the public in its current location.

Currently curatorial staff of the four main research departments (Anthropology, Botany, Geology, and Zoology) numbers approximately 30 and scientific technical staff over 100. The specimens contained in the biological and paleontological sciences include many rare, extinct and type specimens⁴. Anthropologically the museum contains artifacts from around the world representing many cultures and peoples. Annually, the collections are visited by thousands of

³ Collections and Research Annual Report to the Board of Trustees, 2006

⁴ A type specimen is the name bearing specimen of a described species.

scientific professionals and students from around the world who travel to The Field Museum to conduct research. Researchers and students compete for grant funding that numbers in the millions of dollars awarded per year and is an important component of supporting collections and research operations.

Literature Review

Sociological interest in museums often results in a critique of reputation, modes of operation, cultural and symbolic capital, and the museum as a venue for cultural production. As stated earlier, existing literature largely focuses on cultural representations within *art* museums and how it relates to the social order, education, and modes of creating cultural knowledge and capital (Bourdieu 1979; Levine 1988; Lamont and Fournier 1992). The production and canonization of *scientific knowledge*, on the other hand, has been treated in an academic sense and focuses on the role of the scientist (Becker 1952; Latour 1999; Callon and Law 1982, 1997; Collins 1982; Bloor 1996; Barnes 1974). A natural history museum with active scientific research is a combination of both these fields of study (museums and scientific knowledge) and needs to be addressed as such. Advanced theories in scientific knowledge formation have evolved to include both the structure and agency involved in how forms of knowledge fit into and come from our social world. The academic fields of sociology, philosophy, and museum studies address issues surrounding more complex interpretations in the various scientific fields and their recorded history and place in the social world. Sub-disciplines related directly to this pursuit include: History of Science, Philosophy of Science, Social Studies of Science, Sociology of Scientific Knowledge (SSK), and Science and Technology Studies (STS) to name a few.

For the purpose of this study, a review of museum studies literature (museology) is provided as a useful starting point to understanding how the museum as an institution and a scientific research facility function together. The changing role and operational/administrative structure of museums in the late 20th and early 21st century have had an enormous impact on the scientific areas within museums. Following this is a discussion of sociological theories that

further the discussion of institutional operation and individual reactions that affect scientific knowledge production. The complexity of this institution, The Field Museum, is best interpreted through the perspective of Capital, Actor-Network Theory, and Role Conflict Theory.

Museum Studies Literature Review

Museums have always had to modify how they worked, and what they did, according to the context, the plays of power, and the social, economic, and political imperatives that surrounded them. Museums, in common with all other social institutions, serve many masters, and must play many tunes accordingly. Perhaps success can be defined by the ability to balance all the tunes that must be played and still make a sound worth listening to.

- Hooper-Greenhil 1992, p.1

Overall, museum studies considers museums primarily as cultural institutions that have evolved, in part, to satisfy a city or community desire to educate its populace. Since the inception of the first museums, their function and purpose has undergone many transitions. Over the past two decades the theme that stands out most predominantly in the literature is a growing reliance on corporate strategies for museum operation. The shift to corporate mentality means increased focus on expansion, spending on large projects, marketing, “going global” and corporate sponsorship directly linked to specific exhibitions (Mathur 2005). Museum studies that have zeroed in on this theme describe an increase in the prominence of museum stores, exhibits based on popular culture (popularity), global economies and what implications it has to museums, visitors, intellectuals, and knowledge (Rosen 2006; Ashley 2005; Macdonald 1990; Skramstad 2000).

Corporatization

In 1981 Zolberg described the history of museum structure in three distinct eras of museum development: pre-professional; professional; and post-professional. The pre-

professional era began with the inception of museums as a repository for artifacts and objects and funded by private wealthy donors. Curators undertook administration of the museum while trustees were mainly responsible for fiduciary contributions. As museums changed and grew they moved into the professional era. During this time, curators became professionalized to university standards and a focus on collections management standards increased. The post-professional era is signified by capitalistic leadership, increasing expenditure, a focus on blockbuster shows, and corporate style administration and management. Museum administrators have been replaced by MBAs and CEOs pulled from corporations who manage the museum in the same way as the for-profit sector they were trained in.

In the years since Zolberg's 1981 publication the post-professional era has been described throughout the literature and identified as being a by-product of globalization or post-capitalization (Max Ross 2004; Mathur 2005; Yount 2001). What this has meant for museums has been described as follows: "the corporatisation of institutions and declining public-sector funding has led to increased autonomy for institutions and closer liaisons with business," (Bosch 2005). Additionally, Barr (2005) definitively states:

To put it bluntly, it is blindingly obvious that the consumption of culture for most people most of the time has very little to do with public subsidies for creative work or audience-building or widening access strategies. It has everything to do with the performance of market-oriented cultural industries and mass-popular consumption.

The corporatization of museums is a well established phenomenon and integral to understanding the scientific research portion of museum operations. This corporate structure changes the traditional role of scientific personnel within the institution (Max Ross 2004) as individuals trained to conduct scientific research are increasingly asked to conduct business related activities as well. For instance, researchers are asked to lead private tours of collections and they review selected merchandise to be sold in the museum store for scientific accuracy and legitimacy. In

some cases a curator's current research is geared towards popular topics for publicity and institutional recognition.

Blockbuster exhibits

As stated earlier, museums are increasingly involved with generating their own income due to decreasing support from government sources. One method that has had positive results is to draw large crowds to the museum via a "blockbuster" exhibit. The blockbuster exhibit is selected due to its ability to draw the most visitors due to the popular nature of the subject matter. More visitors translates into increased cash flow by way of ticket sales, store purchases, and food services. The concept of the blockbuster exhibit is not new to museums. In 1977-79 an exhibit on King Tut (The Treasures of Tutankhamun) traveled to six American museums and attracted the attention of millions of people (McAlister 1996). At the time, King Tut was considered the most successful and popular exhibit of all time in North America. The Field Museum hosted this exhibit and to this day the year 1977 drew in the 3rd most visitors in the museum's history (see Fig. 1). Since then, blockbuster exhibits have generated both increased income and scrutiny as to the purpose of museums. Many scholars question the content of these exhibits and their academic integrity. While this can spark a heated philosophical debate, the museum is fiscally responsible for operation.

In light of the blockbuster exhibit phenomenon, it has been argued that attracting the visitor becomes more important than disseminating knowledge and educating the public as to true trends in scientific research (Rader and Victoria Cain 2008). This is especially true when marketing strategies consider the museum to be in competition with other venues for the visitor's

economy of time⁵ (Neil G. Kotler and Philip Kotler 1998). Consumerism and museums are subsequently related to knowledge formation through the transmission process of the exhibition/patron interaction. The process by which knowledge is disseminated depends on the participation of both parties (the individual and the institution). When the institution begins catering to what is “popular” and will draw the biggest crowd the choice of what gets disseminated is taken away from the pool of knowledge generating scientific research and placed in the hands of the masses, or what is deemed to be the mass interest.

Iconization and Merchandising

Iconization and merchandising is a large part of the capitalization of museums and has evolved from the increased income that is generated by this two-part process. First, popular items in museum collections or the building itself become widely recognized by the general public. Perhaps the most salient example would be the *Mona Lisa* painting by Leonardo Davinci held by the Louvre in Paris⁶. Iconic buildings include the flowing steel of the Guggenheim Museum in Bilbao Spain designed by Frank Gehry, the all glass Pyramide du Louvre in Paris designed by I.M. Pei, and the moving birdlike sculpture/building of the Milwaukee Art Museum in Wisconsin designed by Santiago Calatrava. The closest link to this phenomenon can be seen in the tourism industry, which is said to be the largest economic sector in the world (MacCannell 2002) with museum tourism being one of the fastest growing industries (Bosch 2005). Since museums are often a destination for tourism, larger institutions focus on making world-wide

⁵ The concept of “economy of time” refers to the limitation we all have of time. While an individual’s financial economy may vary, the total amount of time in any given day is static. If there are more options, the competition increases and marketing becomes key to attracting patronage. By entering this arena, the museum is now in competition with sporting events, theater, music concerts and other leisure activities.
⁶ Other examples include: *Starry Night* by Vincent VanGough held by the Museum of Modern Art in New York City and *Nighthawks* by Edward Hopper held by the Art Institute of Chicago.

recognition. The architect and architecture of a museum is a starting point to making the institution recognized internationally (Bosch 2005; Barr 2005).

Internal holdings of an institution represent an additional opportunity for international recognition if marketed properly. Artworks are printed on keychains, playing cards, clocks, greeting cards, purses, scarves, ties, t-shirts, umbrellas, etc. The list could go on for pages. The Field Museum has been able to successfully market a *Tyrannosaurus rex* skeleton 'SUE' on an international level and will be discussed later.

Museum studies literature helps to describe how museums function in the 21st century through corporatization, blockbuster exhibits, iconization and merchandizing. Implications for scientific research staff working within the institution are affected by the functioning of the institution. Scientific researchers must navigate the dichotomous crossing between research goals and institutional strategies. Role conflict and actor-network theories help to further understand and analyze the complications and outcomes specific to this venue. Furthermore, capitalistic tendencies of museums in the 21st century influence scientific research (knowledge formation) by influencing both scientific researchers and exhibit content.

Sociological Theory

Reputation and Capital

The social world is accumulated history, and if it is not to be reduced to a discontinuous series of instantaneous mechanical equilibria between agents who are treated as interchangeable particles, one must reintroduce into it the notion of capital and, with it, accumulation and all its effects.

(Bourdieu 2001) p. 96

Throughout his work Pierre Bourdieu continually dealt with the importance of considering capital as an element of social structures and interaction that extends beyond monetary assets. More specifically, he discussed the role social, cultural and symbolic capital plays in attaining and maintaining status in the social world (Bourdieu 1977, 1979, 1989, 1993) and it has become accepted terminology across disciplines. In relation to this study, interconnections between the individual and the institution influence knowledge formation and are linked in part or in whole by the relationships between social, symbolic, cultural and economic capital. Using paradigms described in *Distinction* (1979), Bourdieu delineates a three dimensional space (physical or metaphoric) that is a sum of the total volume of capital, the composition of capital (in its various forms), and the change in these properties over time (p. 114). In the three dimensional physical space that defines The Field Museum, the balance among different forms of capital is critical to maintaining the sum of all capital and subsequently the institution itself. In this scenario, forms of capital become critical to the discussion of scientific knowledge due to their saliency in the functioning of the institution as a whole. Without the institution, scientific staff would not have a physical place or the financial support to conduct research and house collections. However, the cultural, social, and symbolic capital that is a byproduct of researchers, scientific knowledge, and collections plays a key role in maintaining the economic capital of the institution.

Using Bourdieu to define capital

Symbolic capital is described in *The Logic of Practice* as honor, prestige, and recognition based on accomplishments (Bourdieu 1992), p. 120). It is a form of credit built upon actions taken by the individual. Additionally, Randal Johnson summarizes Bourdieu in the introduction to *The Field of Cultural Production* by stating: “*Symbolic capital* refers to degree of accumulated prestige, celebrity, consecration or honor and is founded on a dialectic of knowledge (*connaissance*) and recognition (*reconnaissance*),” (Bourdieu 1993). In other words, symbolic capital is built up over time and accumulates for the benefit of the individual or institution. The net accumulation of symbolic capital over time produces an image/perception by others. In the case of The Field Museum symbolic capital can be seen with the accumulation of awards, scientific publications (of which posters of the cover pages line the walls to the president’s office), listing the total number of Ph.D.s that work within the building, etc. It is important to keep in mind that symbolic capital can both increase or decrease depending on individual activities and must be actively maintained.

The collective capital of a group assumed by each individual that claims membership to that group either by proximity, affiliation or formal membership is termed social capital (Bourdieu 2001). The connections an individual has across multiple social groups and organizations are an important factor in accomplishing goals by utilizing the resources and assets of each group or organization. An individual may have connections to many different groups and organizations, and the greater the quantity of those links the easier it is to form new ties and to achieve future goals and maintain reputation. In relation to the museum, social capital is important when fundraising for the ability to cast as wide a net as possible when identifying potential funding sources. For example, the social capital of a well-connected CEO who has

links to businesses with corporate sponsorships and associations with wealthy individuals as well. Additionally, the accumulated symbolic capital can be used as an incentive for individuals to desire a form of social capital by purchasing an annual membership to the museum.

Cultural capital is based on non-monetary assets both physical (objects) and conceptual (knowledge, skills, titles, experiences). Cultural capital is subdivided by Bourdieu into three categories: embodied, objectified and institutionalized (Bourdieu 2001). Without going too deeply into each: first the *embodied* state deals with the individual and what he or she possesses as an individual including knowledge and skills. Second the *objectified* state lies within physical objects that have both economic and cultural value, as in artwork, artifacts, or written works such as novels or poems. Third the *institutionalized* state takes an individual's knowledge and skill set and places it within the framework of a socially legitimized defined accomplishment represented by a certificate or degree (Bourdieu 2001). This institutionalized state requires that the individual accomplish a defined and measurable set of tasks through time and effort. What cultural capital does for a given entity is to legitimize practices/goals so that overall perceptions are favorable for continued function and elevation of status and prestige.

Defining capital in a sociological framework clarifies structural characteristics of the institution. In an institution such as The Field Museum, the sum of capital as well as the balance between varying manifestations of capital is critical to maintaining function. Using the Bourdieuan model, capital is embodied in everything The Field Museum represents: the individual, objects, and the institution. Social capital helps generate revenues by using the interconnections that influential individuals have among many groups. Symbolic capital is developed through the prestige and accomplishments most visible to the public: the types of exhibits, size of the institution, value of endowment, and scientific research. Cultural capital is

embodied in the individuals who make up the institution, from the affluent CEO, the cultural and biological objects housed within, and the myriad degree-holding scientists who come from all over the world to work at this particular institution. In considering the creation of The Field Museum as reported earlier, "...to define Chicago as an international and cosmopolitan city..." by "...hiring the best talent money could secure..." as well as retaining the artifacts from the world's fair, it is clear that the creation of symbolic, cultural and social capital for the city of Chicago was a key intention.

Role Conflict (Ambiguity) Theory

Kahn et al. visualized role ambiguity and role conflict as intervening variables between the structural characteristics of an individual's organizational position and personal, behavioral, and affective consequences.

- Pearce 1981

Conflict theory can be approached from two perspectives. First, it can be approached through the study of complex social systems that are said to be characterized by role conflict (Lauicht 1955). This generalized approach maintains that any group of individuals, whether organized into an institution or not, will contain aspects of role conflict. This approach focuses on antagonism among social groups that highlights tensions and friction that result from differing goals. Second, and more relevant to this study, role conflict can be applied to specific defined institutions such as a corporation, university or, in this case, a museum and the individuals who work within. As part of any functioning institution, the mission of the institution and the goals of the individual often produce conflicting strategies and actions. For example, academic deans of universities hold positions that lie between university administration and college faculty. Because of this they experience a difficult role in balancing what the university administrators expect and what the faculty desires (Mimi Wolverton, Marvin L Wolverton, and Gmelch 1999).

This is similar to the curator⁷ who is both responsible for supporting the goals of the museum (institutional administration) and their own scholarly research. Their research output is key to maintaining status and prestige (reputation, capital) for both the institution and for themselves. However, individual pressures arise when research interests/goals do not align with the interests/goals of financial supporters (individual donors or institutions), administrative decisions, or public popularity.

The variance in goals between individuals produces conflict, but in order to maintain functioning the various individuals/groups must ultimately work together to yield any results at all. Rather than focusing on the negative connotation of 'conflict' in Role Conflict Theory Pruitt (1992) approached the issue by focusing on the ways individuals and institutions interact to achieve mutually beneficial outcomes. In other words, how they compromise to navigate through their differences. With respect to museums and scientific research, individual actions may conflict with immediate goals but overall outcomes are beneficial. It is a process of overcoming obstacles based on conflict to achieve goals that benefit both the individual and the institution. This approach is more relevant and appropriate to the operations of the museum and the individuals who operate within. Specifically, the scientific research staff is affected by the functioning of the museum as a whole even when their particular research goals are not reflected in museum exhibitions. In order to conduct scientific research the museum as a whole must remain operational. In this sense, Role Conflict Theory factors into understanding the functioning of the institution as a public museum and subsequent knowledge formation because it plays to both the sociological (the group/institution) and the psychological (the individual) (Bates 1962).

⁷ At The Field Museum, curators are charged with both overseeing the maintenance and use of collections and maintaining an active research program with publications in high-ranking scientific journals and books.

Actor-Network Theory

The scientific analysis or study of knowledge and scientific knowledge has a long history involving several related disciplines that can be traced back to Sociology of Knowledge. As a formal discipline, Sociology of Knowledge is attributed to Max Scheler and Karl Manheim (Kilzer and Eva J Ross 1953) and was also discussed at length by pioneers in sociology such as Marx, Durkheim, Mills, and Merton. Early in this discipline the natural sciences were only marginally studied and published on. It wasn't until the 1970s that the sub-discipline of Sociology of Scientific Knowledge (SSK) was instituted (Lynch 1994) to create a discourse on knowledge forming processes specifically related to the scientist. A particular aspect of SSK is the notion of personal interest on the part of the individual (Ylikoski 2004) and has been characterized as scrutinizing science through the responsibility of the scientist (the individual). For example, Becker (1952) describes the role of the scientist to be one of "ethical neutrality" and "value-monotheism" (i.e. the scientist should be first and foremost a scientist). This has led SSK to be criticized for focusing too heavily on individuals in describing the nature of scientific work (Stark 2001; Swidler and Arditi 1994) while neglecting the peripheral sources that also play a role. In SSK there is a focus on the individual or "scientist" and the role partaken through agency in the creation of knowledge. This aspect of knowledge formation is only one representative element of the whole. Little discussion considers broader issues including institutions and the objects of study.

Actor-Network Theory (ANT) is derived from Science and Technology Studies (STS) in opposition to Sociology of Scientific Knowledge and in many ways provides a broader analysis of scientific knowledge. When considering scientific knowledge in the context of the institution

ANT more universally encompasses the process and factors related to operationalization. Actor-Network Theory evolved to better describe and account for knowledge formation (Law and Hassard 1999). This is a direct result of SSK being too myopic in scope; focusing too much on individual and personal interests to explain knowledge formation (Callon and Law 1982). ANT evolved to include not only the influences and internal processes of the individual, but also the social factors involved in the field of study. ANT considers networks to be of critical import in the formation and reproduction of knowledge. The network is a made up of the relationships between individuals, institutions, physical objects, and concepts directly related to the previous sections on capital and role conflict.

Law (1999) and Latour (1999) borrow ideology from Deleuze and Guatari (1987) regarding an aversion to duality in describing the core ideal of Actor-Network Theory. As Latour states it is not meant to trigger thoughts of the sociologists dilemma of structure vs. agency but to elicit the metaphor of a fractal (Law 1999) because what is studied is always “more than one but less than many” (ANT is not duality nor multiplicity nor plurality). Additionally, in a theory of Science, Technology and Society Studies (STS) Callon and Law (1997) state if sociological analysis is to overcome the individualism/holism division it should attend to the range of hybrid configurations. Just as “the museum” is a single entity with all the expectations and goals attributed to it, it must also navigate the social world to achieve its goals. Marketing strategies are used to attract visitors; high profile research is maintained to attain funding through grants and fellowships; and rare and unique artifacts are acquired for display. The museum is much more than its mere physical existence. Likewise, the researcher finds him/herself caught up in the same social network, navigating myriad interconnections in order to

maintain status while accomplishing the scientific research and knowledge formation that is desired.

ANT can be applied to both the institution (as an actor) and the individual actors that work within. The reason for integrating Role Conflict and Actor-Network theories into this research stems from the discussion on the museum as an institution and as an entity almost organic in nature that requires a level of functioning and interaction among all the participants in order to survive. The administration manages finances, donations, exhibits and the business side of operations while scientific staff manages social and symbolic capital through research, enhancing collections and procuring prestigious grants and publishing. The building itself stands as an icon along with the collections and galleries; all of which need to be maintained by support staff throughout the building dedicated to the presentation, safety and functionality of the building.

Methodology

This research is based on the principle of participant observation resulting in a qualitative institutional analysis. It is a culmination of twelve years of work as a Vertebrate Fossil Preparator⁸ at The Field Museum with the last four to five being relevant to the sociological research of this thesis. Employment at this institution includes interactions directly with professionals in the field of paleontology (paleontologists, collection managers, fossil preparators) as well as school groups, museum visitors, amateur paleontologists, donors, board members and scientists outside the field of paleontology. Initial interest in this subject was brought on by experiences at this institution and subsequent study of Sociology at DePaul University.

Because my interactions in this particular field began well before the inception of active research, initial observations and thoughts described throughout this thesis existing prior to sociological inquiry were reevaluated and solidified by personal interviews to verify opinions formed up to that point. Individual cooperation was made with awareness of the purpose of my inquiries. No attempt was made to distort or conceal my intentions in this matter. I found the scientific community eager and interested in the topic as it relates to all scientific research as a whole. Naturally, some observations were made purely through passive observation, however, the information taken from these interactions is reported in such a way as to avoid divulging any institutional or individual confidentialities. Overall impressions of relationships between individuals are reported without specific reference to named individuals. While the majority of

⁸ A fossil preparator has the task of making the specimen ready for research or display. This involves removing the surrounding rock from the specimen, stabilizing and assembling specimens as they are collected in the field as well as making molds and casts and sometimes mounting specimens.

observations and interactions took place at The Field Museum, some comparisons were made at additional natural history museums with respect to presentation of material and observations of visitor interaction. Additional institutions included are listed in Appendix C.

Observational data led to analysis of existing quantitative data to use as supporting evidence of museum operations. Financial records, museum administration references, collections statistics and staff demographics have been corroborated with published public documentation and records.

This is not intended to be merely a description of The Field Museum but a wider reaching analysis of scientific research and ultimately knowledge as a whole. The purpose of using The Field Museum as a focal point is to capitalize on the unique place this institution holds among other museums that have active research programs. The conformities the museum holds to museum studies literature are evidence for its place within the broader discussion of sociological causes of and consequences to knowledge formation. Additionally, The Field Museum is recognized as a world-renowned scientific institution that maintains the highest standards in research and collections.

Ethnographic data

My personal experiences at The Field Museum play a large role in supporting and defining this thesis. I have been an employee of the museum since February, 1996. I worked as an Administrative Assistant to the Vice President of Academic Affairs for nearly two years then moved to the Geology department where I was trained as a fossil preparator. My experiences in this position provided insight to both the scientific research of paleontology and how individuals react to the operational strategies of the museum as a whole. In the fall of 2004 I entered the Master of Liberal Arts program at DePaul and soon became interested in thesis research on how scientific knowledge fits into our larger social awareness and specifically, how the operations at The Field Museum are part of it. What was most striking to me came from experiences in the Geology department and the field of paleontology. I came in at a time when The Field Museum had acquired the *Tyrannosaurus rex* known as SUE™⁹ at auction for \$8.36 million. The purchase of this specimen at auction was an unprecedented event both in the amount paid and in the method of purchase by a non-profit institution such as The Field Museum. In order to secure funding the museum assembled a consortium of corporations and private individuals to pledge donations that contributed to the total cost, two of the most prominent being the McDonald's Corporation and Walt Disney Company.

Fossil preparation staff in the department had previously been only around 2-3 full time staff (variable depending on funding). Of these, only one position was a full-time regular operational budget preparator. Any others were funded by 'soft money' (grants, donations, etc). After SUE™ the department had secured six full time operational budget preparators. The

⁹ Further reference to this particular *Tyrannosaurus rex* will be simply SUE™

fallout of what became known internally as “the SUE™ project” (sometimes uttered with joy and sometimes with frustration and disdain) had implications for both the department and the museum.

The unveiling of the mounted SUE™ skeleton in May of 2000 was at a time of economic prosperity for the nation as a whole. The Field Museum was expanding in both staff and physical space. Since then, the museum has experienced a dramatic financial downturn that has provided further insight into the functioning and consequences of the corporatization of museum operations (Dalton 2008). In the ten years since the unveiling of SUE™ the museum has further utilized marketing strategies that revolve around generating income by diversifying salable resources while still maintaining its original mission. Additionally, the fossil preparation staff has been reduced to two.

The Field Museum (*of Natural History*)

In this section the three main points of the previously reviewed museum studies literature are evaluated in direct correlation to The Field Museum: corporatization, blockbuster exhibits, and iconization and merchandising. These aspects of museum operation provide insight to the functioning of scientific research within The Field Museum and lay the groundwork for applying sociological theory to the formation and dissemination of scientific knowledge.

Corporatization

As stated earlier, the corporatization of museums has brought with it structural and managerial changes that led to administration by CEOs and MBAs drawn from the corporate world. This process has two characteristics: First leadership shifts away from individuals drawn from academia and towards corporate individuals. Second the new corporate leadership reconfigures the administrative structure and adds executive positions in line with a more capitalistic approach. The current President and CEO of the institution joined The Field Museum in 1996 with a resume that includes Senior Vice President of Booz Allen & Hamilton, Inc., and President of DeKalb Corporation. His history as an executive in the corporate world brings with it connections to corporations and executives outside the field of academia. During his tenure at The Field Museum the administrative structure has dramatically shifted. Table 1 below highlights how the total number of top executive positions has increased over time.

In relation to the increased number of executive positions, it should be noted that the positions created between 1986 and 2007 largely deal with income and fundraising strategies (Executive Vice President, Provost, Senior VP Strategic Initiatives, Senior VP Museum Enterprises, VP Auxiliary Groups and Board Relations).

1893	1976	1986	2007
President of Board Director of Museum	Chairman of Board President Director	Chairman of Board President VP Academic Affairs VP Development VP Exhibits VP Education	Chairman of the Board President and CEO Executive Vice President Provost, Academic Affairs Senior VP, Collections and Research Senior VP, Strategic Initiatives Senior VP, Environment, Culture & Conservation Senior VP, Museum Enterprises VP and General Council VP, Institutional Advancement VP, Auxiliary Groups and Board Relations VP, Administration VP, Operations

Table 1: Snapshots of Field Museum Administrative Structure

Likewise, the executive (VP) positions specifically for the administration of education or exhibitions were eliminated; two key elements of the museums stated mission (Appendix A). It should also be noted that due to more recent financial difficulties and further restructuring, the positions of Provost, Academic Affairs and Senior VP, Strategic Initiatives have been eliminated. Further changes in structure are likely as positions are vacated and others are promoted.

Capitalistic/corporate leadership also led to systematic increases in expenditures on major projects. The Field Museum has spent over \$250 million dollars in the past ten years on capital projects including the construction of a 180,000-square-foot underground collections storage facility, renovation of *Life over Time* exhibit (now *Evolving Planet*), renovation of *The Ancient Americas*, construction of an East Entrance, construction of the Crown Family Play Lab, and construction of the DNA Discovery Center public lab. This expenditure is roughly equivalent to the current value of the museum’s total endowment. Payment of projects has been funded in part by the sale of bonds, putting the museum’s overall debt (notes payable) at a level of roughly \$180 million. Taking on such debt, combined with the coinciding national economic downturns has put the museum in an overall unfavorable financial situation that has brought on severe budget cuts in both budgetary spending and staffing levels.

Blockbuster Exhibits

The concept of the “blockbuster” exhibit has a long history. Just like blockbuster movies, blockbuster exhibits are developed to draw the largest audience possible for the purpose of commercial success. Drawing a large audience has an impact on two fronts. First, it increases income directly from admission ticket sales¹⁰. Figure 1 below illustrates prominent spikes in visitorship in years that included major “blockbuster” exhibits.

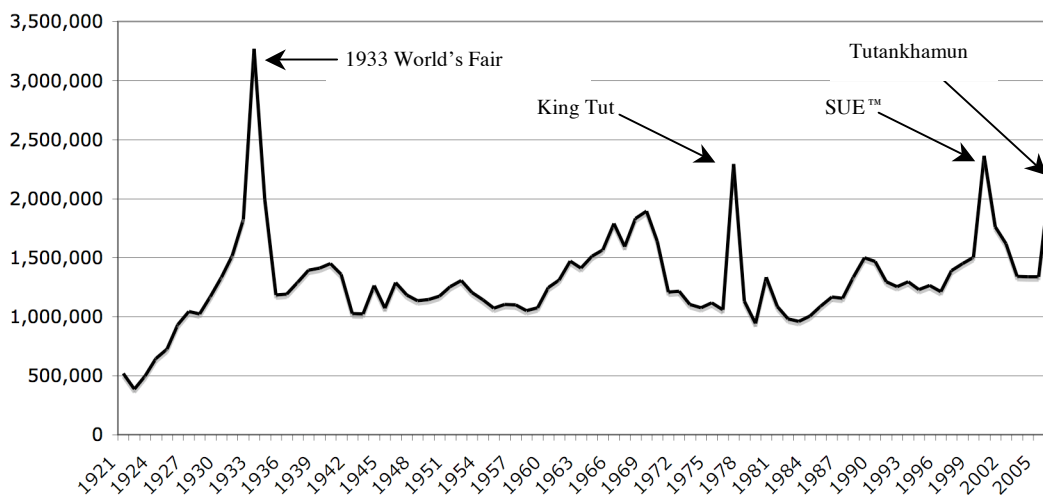


Figure 1: Field Museum annual attendance since opening (1921-2006)

Second, the museum generates additional income through merchandise and food sales. At the time I began employment in 1996 the museum operated two small stores. Since then, the main store has quadrupled in size and the museum has added two more stores for a total of 4 regularly operating stores within the building. During special exhibits a temporary store is opened selling merchandise specific to that exhibit. The Field Museum also operates 2 small stores at O’Hare International Airport. One is located at the United Airlines terminal located next to the

¹⁰ Ticket sales generate increased income from both general admission and from the additional ticket that must be purchased specifically for the special exhibit.

Brachiosaur skeleton cast that was displaced from the museum by the installation of the mounted skeleton of SUE™.

An examination of Revenue sources of The Field Museum¹¹ for the year 2006 reveals that 20% of revenue comes from Business Enterprises, which includes museum stores, special events and food services (Figure 2). Additionally, if the revenues from Business Enterprises, Admissions and Memberships are combined, over one third (36%) of revenue is accounted for. In 2006 The Field Museum hosted the ‘Tutankhaunum’ exhibit which helped to boost revenues in these areas¹².

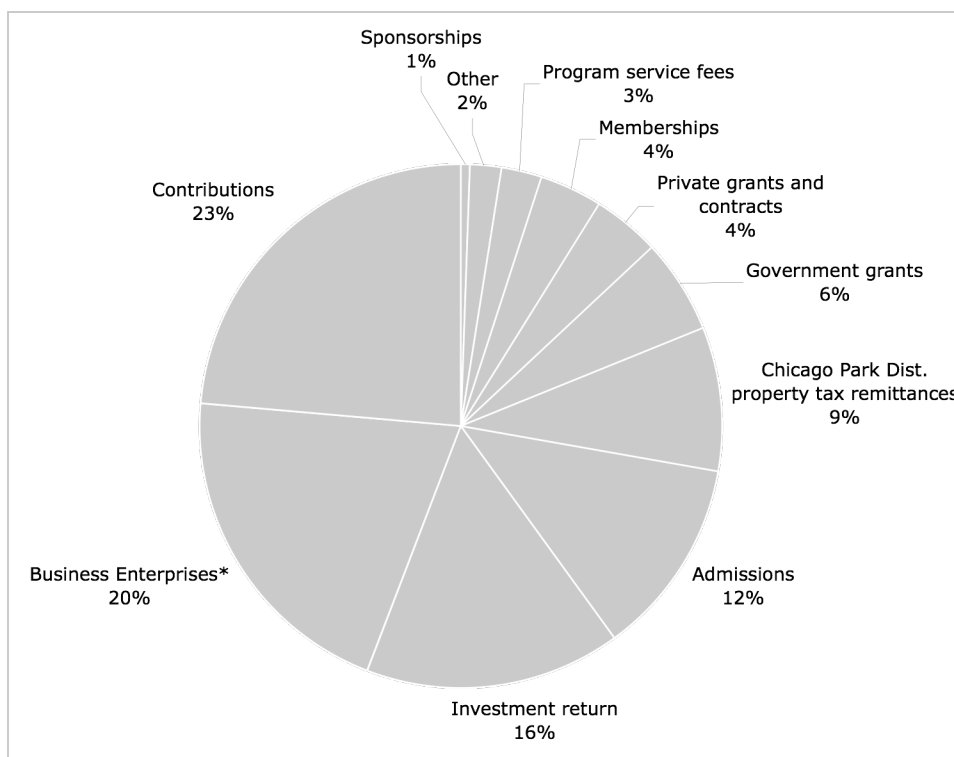


Figure 2: 2006 sources of revenue as percentage of whole

In summary, the “blockbuster” strategy produces real and observable gains. A spike in visitorship for the year (see Figure 3) corresponded to the popularity of this exhibit as well as

¹¹ Field Museum of Natural History Financial statement and independent Auditor’s Report is available to the public and is downloadable from The Field Museum website (www.fieldmuseum.org) for the years 2005 and 2006.

¹² Figure 2 can be compared to the following year (2007) revenues and income to see a shift in the distribution of income sources (see Appendix B).

record sales in the museum store. While The Field Museum normally experiences a spike in the summer months, traditionally the winter months, starting in September show a decline. The Tutankhamun exhibit ended the first day of January 2007 and a spike in last minute visitors caused a noticeable increase during these months rather than their usual downturn. This illustrates the importance of not only what exhibits are chosen, but the timing of openings as well. An often-used strategy is to open large popular exhibits in time for the spring break crowds typically seen in March.

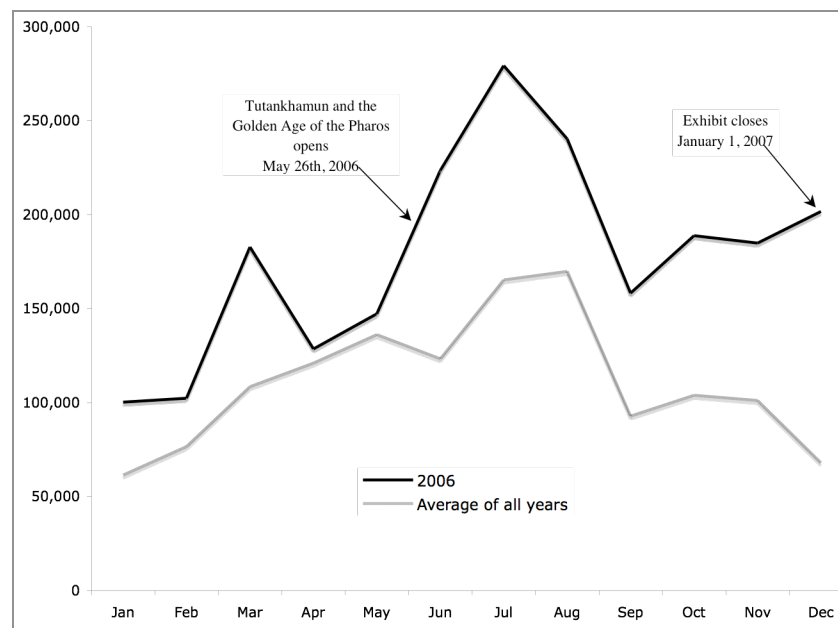


Figure 3: Field Museum monthly attendance (2006 and average)

Iconization and Merchandizing

Museum studies literature notes a strategy of creating icons of buildings and merchandizing images of specific objects in a collection. This is a phenomenon that has transferred itself from corporate style marketing. The museum has participated in this strategy as well by trademarking a logo associated with the previously mentioned dinosaur known as

SUE™¹³. A visit to the US trademark website reveals trademarks to include an extensive list of merchandise¹⁴. The handling of the dinosaur known as SUE™ has turned this paleontological specimen into an icon with world-wide recognition. While the species *Tyrannosaurus rex* has maintained a certain level of popularity among dinosaurs, this particular skeleton has been capitalized on by The Field Museum with two exhibits featuring a full sized complete mounted cast traveling not only the country but around the world (Hungary, Kuwait, United Arab Emirates, New Zealand, Thailand, Taiwan, Singapore, Japan). Because merchandizing is trademarked, the museum benefits from store sales in traveling venues of plush toys, books, clothing etc. marked with the official logo. Additionally, by exporting this specimen outside the footprint of the museum, a much wider audience is reached and the museum's Brand is experienced on a global scale.

While there are some visible gains and justifiable reasoning behind the blockbuster exhibit and iconization strategies, the hidden costs are much more difficult to ascertain. For instance the costs involved with obtaining and operating a traveling exhibit are not expressed here, nor is the cost of developing and marketing a traveling exhibit. While the Tut exhibit may have generated visible incomes from various sources, the cost associated with gaining access to this exhibit is rumored to be excessive. In addition to standard fees associated with attaining a given traveling exhibit, popular traveling exhibits are often bid on by multiple institutions, sometimes within the same city. The winning institution pays a premium for the privilege of

¹³ The logo consists of the text SUE at The Field Museum with an outline of t. rex overlaying the text

¹⁴ The trademarks (serial numbers 78315238, 75982321, 75982091, 75596877) list many items including (but not limited to): toy model vehicles, toy model hobbycraft kits, toy model dinosaurs, toy plastic dinosaurs, toy building blocks, jigsaw and manipulative puzzles, board games, word games, word puzzles, crossword puzzles, puppets, dolls, toy vehicles, toy cars and toy trucks, toy action figures, musical stuffed toys animals, plush toys, marbles, yo-yos, sports and rubber action balls, bean bag toy animals, balloons, flying discs and christmas tree ornaments, handkerchiefs, towels, beach towels, bedspreads, bed blankets, quilts, tapestries of textiles, washcloths, backpacks, fanny packs, carry-on bags, travel bags, luggage, briefcases, suitcases, wallets, purses, umbrellas, textile shopping bags, tote bags, decorative magnets, sunglasses, cases for sunglasses and eyeglasses, eyeglass straps, sunglass straps, magnifying glasses, motion picture films featuring a tyrannosaurus rex fossil, mouse pads, computer screen savers, computer game cartridges, video game cartridges, cassettes and discs, interactive computer game software and interactive cd-rom

hosting a particular event. Exhibit costs and venues are too detailed and complicated a matter to fully discuss here. This is a small and simplified account of museum funding operations. There are many aspects of museum funding that are not covered here. The blockbuster and icon strategy has been employed with observable gains through revenues and attendance. A more detailed analysis of financial aspects of operation, income and spending would no doubt shed more light on this phenomenon. This analysis is only meant to shed light on some museum strategies employed in day-to-day operation to maximize the possibilities for generating income. Additional non-monetary costs of exhibit development relevant to traveling exhibits relate to wear and tear of specimens and artifacts. Each venue on a touring exhibit's itinerary means repeated handling during unpacking and packing as well as jostling and vibrations during travel.

Scientific Research and Knowledge Formation

But '*science*' no longer means the knowledge that anyone has or may have. It does not mean a poet's knowledge, for instance, or a carpenter's, or even a philosopher's or a theologian's. '*Science*', today, is a special kind of knowledge possessed only by '*scientists*.' Scientists are special people. They are not anybody.

- (Van Doren 1992)

The Field Museum was founded as not only a public exhibit space, but also a repository for world-class collections supported and supplemented by world-class research. A large part of what the museum represents to the city as a whole is based on the ability of its scientific staff to relate to the public and share knowledge about the natural world. The Collections and Research Department encompasses four divisions of scientific research: Anthropology, Botany, Geology, and Zoology. Currently, curators, post-doctoral researchers, and doctoral students conduct scientific research in their area of specialty, publish their findings in peer-reviewed journals, collaborate with other researchers, review manuscripts, and attend scientific conferences. To the workers in this field, the craft of "science" is established and well understood. But to the general population that does not experience this process first hand, what is science? In the quote above, Van Doren denotes an important perceived separation between scientists and the general public. Aside from the textbook definition given to the term *science*, the word itself holds a greater social meaning with implications of authority and distinction as well as containing cultural, symbolic and social capital.

Accessibility

The most visible social outlet for scientific information transmission can be seen within the media and how the natural world is reported through popular news agencies. An in-depth

analysis of science in popular news is an entire separate field of study, but it is important to note the two most important factors for knowledge transmission in this field are *what* gets reported and *how* it is reported. Additionally, the treatment of such information/knowledge by the reporting agency goes towards creating a mystique around both the scientist and the knowledge itself. The *what* and the *how* of scientific knowledge transmission are the core of this particular study of this particular institution. At a scientifically based museum, the routes individuals are able to take to access the scientific knowledge being produced include: exhibitions, collections, exclusive private events, lectures, and website publications. Each route requires a particular level of interest, motivation and financial investment.

For the majority of museum visitors, the level of interest does not go beyond a typical day of visiting, purchasing tickets to special exhibitions that have drawn them in, wanting to see things *in person* (such as dinosaurs). These visitors get a day of entertainment and occupation with the ability to gain the knowledge presented via labeling in exhibits, paying extra to see a short movie in the 3D theater, participating in docent-led tours, or on selected days are able to speak directly with scientists and technicians who set up stations in the main hall. Observing visitors on a daily basis provides an insight to the diversity and range of interest that seems to draw people to the museum. The blockbuster exhibit crowd, usually the most openly enthusiastic with families and children, are drawn to the entertainment and amusement aspects of these exhibits. Notably, the recent *Real Pirates* exhibit drew in many families with children anxious to see pirates and parade themselves through the museum in their pirate attire complete with toy swords, eye patches and bandanas (all items available for purchase in The Field Museum store). The museum's main hall was decorated with life sized realistic sculpture pirates climbing ropes hung from the balconies, and swords carried within their teeth. The exhibit,

which chronicled the story of a real pirate ship, coincided with the mass popularity of the fictional Walt Disney film trilogy *Pirates of the Caribbean*.

Additionally, a large part of routine daily visitorship comes from school groups. Schools often come prepared with worksheets developed and attained through the Education Department of the museum. Students were observed attempting to fill out the worksheets based on specific exhibits. Some stop to question museum staff entering or leaving the public lab on the answers (often wanting answers so they can complete an assignment without any real interest in the information itself). Observations and experiences both within the museum space and working in the public preparation facility give the impression that for the majority of middle and high school age groups their own social interactions, such as awkward attempts to impress peers, take precedence over the museum exhibits and learning. For groups of younger aged children, upon observation, the visit seems to be about not getting lost, forming lines, holding hands, and making lunch and bathroom breaks successfully.

I have had much better experiences and results when interacting directly with school groups that have arranged behind-the-scenes tours. The groups are often more directed by instructors before coming to the museum, and have backgrounds that allowed them the opportunity to access the private tour. This includes some groups who are academically gifted, groups who come from higher socioeconomic status (and thus have a connection that allows them access) as well as underprivileged and underperforming schools. The relevant factor is the personal interaction with an authority figure directly associated with the museum. Among the private tour school groups, the majority of students pay attention and ask relevant questions. This is in large part due to the opportunity to describe exactly how the process of paleontology works, including not only the “glamorous” portrayals in popular culture (such as Jurassic Park)

but also the tedious process of fossil preparation, the years it can take to study and describe a new species, and the importance of proper storage and maintenance. Unfortunately, there is a limit to how many groups can be addressed in this way. The tours are time consuming and take away from valuable time needed for preparation and other departmental duties and goals. This is especially cogent under the corporatized landscape that has produced large debts requiring significant reductions in staffing.

On a higher level, individuals who possess a greater desire and interest in the kind of scientific knowledge and cultural awareness the museum has to offer can attain a more in-depth relationship with the museum with economic capital by purchasing a membership at varying funding levels (see Appendix D). Beginning with basic admission, a family of four (two adults and two children) will pay anywhere from \$50-94 for admission, depending on what ticketing package they choose to purchase. For an additional \$6 over the premium package, the family can become members for an entire year (\$100) or for two years (\$190). There are some perks to membership on top of basic entry, however, as financial investment increases, the perks increase as well. Annual fund members of varying levels (anywhere from \$250-2,500+) receive invitations to private events with lectures by scientific staff, exhibit openings, behind-the-scenes tours. High-level (affluent) donors often host their own private events in their homes or private clubs with curatorial guests who are selected to lecture on their area of expertise.

Bridging the Gap

The stated mission of The Field Museum is to bridge the gap between the researcher and the general public to help the overall understanding of the natural world we live in, including how that information is derived. When starting with a premise that scientific knowledge does

not translate easily to a general audience due to complexities and technical jargon, it is understandable that the museum has a difficult task in maintaining visitorship while holding true to current trends in the scientific realm of the museum. Working with a broad audience such as the general public that is comprised of many different age groups and educational levels makes it even more difficult to determine an appropriate level of complexity to present scientific work. However, the stated mission of the museum is to educate the public in relation to its collections and internal research goals. One method to do this would be to create exhibits around current research and trends in scientific understanding. In some instances this is attempted, however, the time and money required restricts how often and how effectively it can be done; as is pointed out in the interview with the Vice President of Business Enterprises (next section). In most cases, current research does not generate blockbuster exhibits. A second method of disseminating knowledge is through seminars and lectures given by scientific staff. While this does occur, the audience reached is a fraction of total annual visitorship.

A few other notable strategies to engage the general public involve public viewing of laboratories and website development to disseminate more current information on research and expeditions. While the academic departments of The Field Museum operate removed from the public exhibit space of the museum, there have been attempts to make the process of scientific research more visible to the public. The museum now has three operational laboratories located in the exhibit space with windows to the public. The Department of Geology operates the McDonald's Fossil Preparation Laboratory¹⁵, Anthropology operates The Regenstein Conservation and Collections Laboratory and more recently the DNA Discovery Zone was opened. In these respective laboratories scientific staff engage in normal activities related to their work (fossil preparation, anthropological conservation, and DNA analysis respectively).

¹⁵ This laboratory was made possible by funding from the McDonald's corporation.

Even with these spaces that provide direct viewing of the process behind scientific research many visitors still operate on the assumption that ‘science’ is separate from them. On several occasions I listened to visitors as they watched fossil preparators in the laboratory working directly on real fossils. Individuals have been overheard concluding that the preparator is ‘animatronic’ or ‘performing for an audience’ with specimens that are not real, or “they are just pretending to work on real specimens.” Similar stories have been reported by preparators working at The Smithsonian. Additionally, many visitors occupy themselves by attempting to draw the preparator’s attention by waving, or knocking on the glass window and are only satisfied when their smile and wave is reciprocated. Some individuals will spend several minutes getting increasingly animated attempting to get a preparator to look up from the microscope or specimen she is working on. The moment eye contact, a smile and possibly a wave is achieved the visitor will giggle smile and walk away.

The institution and the individual

The four departments within Collections and Research attempt to maintain a focus on high quality research that is unbiased towards popular culture and media. This is due to not only the goals of individuals but also the role that the quality of scientific research plays in the overall reputation of the institution. Research programs that cross over to popular culture are capitalized upon to promote the museum, however, there are many curators and postdoctoral research associates conducting research that is difficult to translate to a general audience (and maintain visitorship and interest). At times this causes conflict among departments and individuals due to the unequal attention given to marketable research topics. One instance relates to two specific specimens in the collection and is illustrated below.

The man-eaters of Tsavo: In 1898 a pair of lions in Tsavo Kenya were killed after reportedly eating over 100 people. The story of these lions has been a popular and sensational item to the general public. The Field Museum owns the skeletons and skins of these lions and they are on display in an exhibit hall for all to see. With the fanfare of the lions and the drama that unfolded during the time of their rampage, the story was dramatized and retold in two feature films (Bwana Devil 1952, The Ghost and the Darkness in 1996). Following the release of the most recent film in 1996 the museum undertook additional research expeditions to both find and excavate the lions' den occupied nearly 100 years prior (Peterhans and Kusimba 1998). The den was found by researchers in the Zoology department in 1997 and was subsequently excavated over a two-week period by the curator of African Archaeology and Ethnography in the hopes of finding additional human remains. Additionally, researchers in Zoology have analyzed their DNA, dissected the composition of their hair, described anatomical abnormalities and published findings as recently as 2009 regarding their diets (Patterson, Neiburger, and Kasiki 2003), (Yeakel et al. 2009). A large part of their report focused on proving or disproving the claims that the lions ate over 100 people. While the process of coming to this conclusion strictly follows the scientific method, it leaves one to wonder about the value in focusing so much scientific research effort and time into one particular set of skeletons. Between the cave discovery, its excavation and the research time of four scientists devoted to analyzing bone, skin and hair, many would contend that it is another example of pandering to popular culture. However, it could more positively be seen as a way to use the collections to educate the public by drawing attention to a dramatic story surrounding specimens from the collection. Regardless of how it is perceived, the research of these two animals is clearly driven by their appeal in popular culture.

The division of Paleontology also maintains high levels of popularity through dinosaur studies and exhibits. The highly visible and popularized treatment of dinosaurs in mass media, films, and books allows the museum as an institution to utilize a scientific discipline to draw both visitors and private donations. This phenomenon has been widely recognized in the field of cultural studies, iconology, and even philosophy of science (Mitchell 1998; Gould 2000; Sanz 2002). This has played an important role in the Geology Department over the past ten years with the purchase of SUE™ and all the marketing and research associated with it as well as hosting multiple traveling exhibits featuring dinosaurs (see Table 2).

Year	Exhibit Title
2000	Picturing T. Rex: Selections from the Lanzendorf Collection
	SUE in Searle Prep Lab
	SUE: unveiling the completed and installed skeleton of T. rex
2001	Kinetosaurs: Putting Some Teeth into Art and Science
2002	Tiniest Giants: Discovering Dinosaur Eggs
2004	Triceratops skull
2005	Dinosaur Dynasty: New Fossil Finds from China
	SUE Discovery Dig
2006	Evolving Planet (reinvented fossil exhibit hall space)
2007	Dinosaurs: Ancient Fossils, New Discoveries
2009	Dinosaurs Alive 3D (Ernst & Young 3D Theater)
2010	Robo SUE
	Waking the T. rex 3D: the story of SUE (Ernst & Young 3D Theater)

Table 2: Temporary Dinosaur themed Exhibits 2000-2010

Business Enterprises

While the bulk of participant observation pertinent to this ethnographic study occurred within the academic realm of museum functioning, business strategies were described in an interview with the Senior Vice President of Museum Enterprises that helped clarify museum strategies for drawing visitors and marketing products, exhibits and services. The office of Museum Enterprises is charged with managing museum stores, overseeing temporary and permanent exhibits, special events, and handling marketing and public relations. An important aspect of this particular department is that it is charged with educating through exhibitions as well as concerning itself with the income-based operations of the museum.

There were in depth comments made on the somewhat unique phenomenon of the *T. rex* skeleton known as SUE™. The year the mounted skeleton and corresponding exhibit was unveiled the museum counted over 2 million visitors with many of them coming soon after the opening in May (see Figure 4). Through the efforts of Public Relations and Museum Enterprises it has become an icon for The Field Museum both in the US and abroad. It was noted that ‘Traveling Sue’ has been particularly popular in the Asian market and products are developed for specific venues (e.g. Japan). This serves both for the purpose of sale and to promote The Field Museum as a destination for tourism. Naturally, due to the extreme distances of these countries it does not ultimately serve the purpose of bringing large numbers of people into The Field Museum. In order to expand the museum’s reach, there have been thoughts of creating an email database or international membership. But as of yet these have not come to fruition.

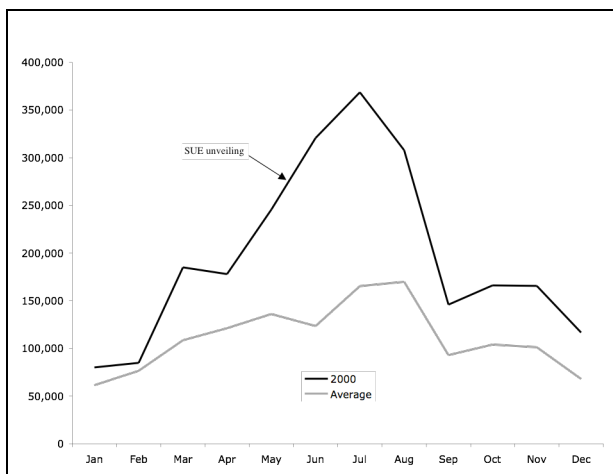


Figure 4: Field Museum monthly attendance (2000 and average)

A large part of the process behind the implementation of the SUE™ project lies within a framework of playing to the audience while maintaining scientific integrity. For example the museum stores do not engage in selling real fossils, only fabrications and casts are available for purchase. This is due to the insistence of scientific staff that oversee the selection of merchandise. Additionally, profit-generating exhibitions are used to support non-profit generating exhibitions¹⁶. It was noted that the non-profit based exhibitions are usually more mission based and draw smaller crowds and less income. These are also targets for outside funding sources like foundations, grants and private donors. The institutions and individuals who have the most interest in the scientific mission of the institution. Corporate sponsorship usually comes with blockbuster exhibits due to the added bonus of promotion afforded a corporation that can attach its name to something that will draw large numbers of visitors.

It was noted that contrary to what may be assumed, city and state involvement with the museum is minimal. The city government is willing to cooperate to suit their needs but it does not otherwise engage in actively seeking collaborations with the museum. There have been some joint programs but not much bending to the ideas and needs of the museum. Funding from

¹⁶ A specific example would be the Tutenkhamun exhibit in relation to the exhibit regarding Gregor Mendel (the father of genetics).

the city has declined as a percentage of total income by way of stagnation in annual city payments. The state government supports the museum through grants and advertising.

While Museum Enterprises is concerned with income strategies it is well aware of the need to maintain the overall mission of educating the public regarding scientific findings and cultural awareness. One method being implemented that will hopefully serve both purposes is the sale of tickets that provide a behind-the-scenes tour of a given collection by qualified departmental staff. Additionally, the museum offers an array of special lectures (either free or special ticket) throughout the year as well as specific Saturdays when scientists are available to the public for demonstrations, explanations and questions (*Scientists on the Floor* program).

Returning to the sociological theory presented earlier regarding conflict theory, and inferring some ideas based on this interview, a pattern evolves that shows an unacknowledged conflict between business and scientific research within museum functioning. Since the goal of business enterprises is to maximize the potential for income, even attempting to keep the educational outreach goals of the museum in mind is difficult when looking at the numbers related to blockbuster exhibits and potential incomes related to store sales.

Collections and Research

Scientific staff of The Field Museum is separated from the business and administration of the museum both physically and philosophically. Physically, the scientific offices occupy the entire third floor and the newly built underground Collections Resource Center (CRC). The administrative and business offices are located on the ground floor in the north end of the building. This physical separation does not allow for routine interaction between the two operational departments. The main reason for interaction involves administrators bringing tours

around to the laboratories and offices of researchers to showcase the scientific aspects of museum operations. These are typically for prospective donors and board members and families and friends of employees. Opportunities for social interaction among staff include museumwide addresses, award ceremonies and the weekly ‘happy hour’ held on the third floor open to all staff. Beer and wine is provided for a nominal fee, to cover the cost, beginning at 4:30pm every Friday. While this is open to all staff, it is held on the 3rd floor and the majority of participants are from the scientific departments. A minority of Institutional Advancement staff attends and occasionally members of the executive staff make an appearance.

The philosophical differences between administration and scientific staff are complicated by the contrasting nature of the two areas. Administrators are focused mainly on revenues and revenue-generating strategies while scientific staff is focused on high quality research and scientific integrity. The reliance on blockbuster exhibits to generate visitorship and revenue is generally viewed by researchers as patronage to the masses and an overall decrease in legitimacy and integrity. Scientific research and knowledge obtained by Ph.D.s is valued independently from the popularity of the general public. The goal of a researcher or technician is to produce the highest quality research, publications and specimens in order to further their career and enhance the pool of scientific knowledge available to humanity. While the knowledge produced is available in a manner inaccessible to most individuals who do not have a full grasp of technical jargon, the community of scientific researchers has a common desire for the general population to be more informed through better education and more targeted and scientifically relevant exhibits. A common frustration is echoed by scientific staff when members of the general public (visitors to the museum) “have no idea what DNA is”, or “can’t find Egypt on a map”. The concept of routine blockbuster exhibits chosen for revenue potential undermines the

opportunity to diversify the public's exposure to a wider variety of topics that would enhance the ability to convey a more encompassing base of scientific knowledge. This is especially true when exhibit themes revolve around similar topics such as dinosaurs.

While it is recognized that these exhibits draw crowds the validity of the argument is still questioned by scientific staff. Oftentimes when discussions of traveling exhibits come up individuals will roll their eyes in a gesture of disapproval or disappointment, while still being optimistic about possible income that may result from a success. These frustrations are more than just philosophically important for the scientific staff that relies on grants and donations for research funding. In some cases real opposition has been made in relation to the cost/benefit relationship due to the importance of maintaining high standards of educational integrity and scientific validity within the larger community. The overall reputation of the institution plays a large role in gaining funding for specific research projects. With major budget and staff cuts in the Collections and Research department the issue is even more critical. Some curators have concerns that The Field Museum's reputation (symbolic/social capital) in the scientific community is slipping (and has already slipped) and if more isn't done to promote scientific research and rebuild programs it will no longer be able to call itself a "world-class research institution". In the future when curatorial positions become available, it may be difficult to attract individuals of the same caliber as in the past.

The outcome of popularizing specific fields of study has a noticeable effect on future scientists as well. An experience working with a high school volunteer who had "loved dinosaurs" since she was three years old and "always knew she wanted to be a paleontologist" illuminates this issue. While this individual had the drive to complete an education in paleontology, at the age she chose her career she was unaware of what scientists actually do on a

day-to-day basis. Even as a high school senior about to enter undergraduate studies she was unaware of the processes behind paleontological research. The question was posed one day what a paleontologist does all day while they wait for their specimen to be prepared. It was clear that there was no understanding of the research process involved in understanding species or writing manuscripts. This does not mean she will ultimately fail in her attempt to complete higher education and become a paleontologist; it is only an indication of her lack of awareness of the process of scientific research due to the focus on the popularity and appeal of dinosaurs.

With the tenth anniversary of the unveiling of SUE in 2010, there has been renewed focus on capitalizing on the popularity of this iconic figure. The museum has hosted special SUE events including a corporate and private donor fundraiser coinciding with the anniversary, and commissioned a 3D movie and special temporary exhibit centered around SUE¹⁷. With this renewed effort to market SUE the Geology Department and its resident dinosaur curator are met with renewed requests that tax their valuable time. However, the 3D movie features current fieldwork and techniques for studying dinosaurs. So, again, the (re)marketing of SUE also provides an outlet for current research even if it is not the main focus.

An additional essential source of funding is through grant monies awarded to the museum that are largely directed towards specific research projects developed and conducted by museum personnel. A grants coordinator pointed out that difficult financial situations are resulting in a push to apply for a broader range of grants in an effort to draw in the maximum amount of funding available. This effort expands the possibilities for funding but also causes researchers to reach further outside their areas of focus and expertise. Additionally, there are restrictions to what a grant can supply in terms of salaries, museum support, and supplies. While increased

¹⁷ Waking the T. rex3D: the story of SUE (movie); Robo SUE: The T. rex Experience (exhibit featuring fleshed out animatronic dinosaurs that track the visitor's movements)

funding through grants does not necessarily aid the museum's overall financial situation a push towards indiscriminant grant application affects the focus of scientific research. In the financial climate in the nation as a whole, grants are more difficult to secure due to an overall increase in applicants and a decrease in supply. It was reported that the market seems to be flooded with individuals looking for money.

The emphasis on acquiring grant funding was further heightened by the possibility of getting a portion of the "stimulus money" from the Obama administration's economic plan. Administrative officials lobbied for funding as soon as the announcement was made that funds would be available. The availability of stimulus money combined with the financial situation of the museum and the overall grant market makes the acquisition of grant and foundation funding more likely to entice researchers to gear research towards more "fundable" projects and away from their traditional research specialties. In a conversation with a paleobotanist it was pointed out that Global warming and climate change is a hot issue currently and programs relating to researching this topic receive funding at a higher rate than other programs. Even in the field of paleobotany, it is advantageous to insert these buzzwords into grants in order to increase the likelihood of securing a grant.

Exhibits and visitors

"Wouldn't it be fun to be an ethnographer and find all this stuff in the ground? To go dig it all up. Wouldn't that be fun? I think that would be fun."

- *museum visitor*

"I want tickets to the one with dinosaurs. Yeah, whichever exhibit has the dinosaurs in it."

- *museum visitor*

When listening in on comments made by museum visitors a familiar trend appears in much of what the visitor is looking for and expecting in their visit. When viewing exhibits with

objects uncommon in everyday life individuals seem to have a mysterious and magical sense of the process behind collecting objects and defining their significance and place in our social world. The museum patron gains a sense of wonder at the exhibit, getting a glimpse of other cultures and animals from the past. Maintaining an idea that ‘digging stuff up would be fun’ ignores the actual process behind the purpose of collecting and the time, effort, and resources it takes to do so.

In the permanent exhibit *Evolving Planet*¹⁸ life is explored from what we know of the earliest and simplest forms up to recent past. This includes fossils of many types including invertebrates, early mammals, mastodons, fish and others. The question I have been asked the most regarding this exhibit is “where are the dinosaurs?” or “where is the dinosaur exhibit?” After answering this question a couple dozen times, one begins to wonder if there is any point to having the rest of the exhibit. To consider only this repeated question is misleading, however, as I have witnessed individuals, once finding the exhibit, becoming engrossed in information and specimens they encounter on their way to the dinosaur section of the exhibit. Visitors have to walk through earlier forms of life leading up to the age of the dinosaurs in order to get to their destination. By positioning the dinosaurs within the context of time and where they fit in evolutionary history, the museum has created a way to compel visitors to experience life throughout evolution rather than just in a hall of dinosaurs.

Perhaps the most important aspect of the mission statement is summed up in the sentence: “Combining the fields of Anthropology, Botany, Geology, Paleontology and Zoology, the Museum uses an interdisciplinary approach to increasing knowledge about the past, present and future of the physical earth, its plants, animals, people, and their cultures.” While pointing out

¹⁸ A bold name that doesn't shy away from the evolution controversy heating up in our nation.

the four divisions of research this sentence leaves the door open to justify just about any possible exhibit theme. The museum adopted the open ended slogan “Exploring the earth and its people” for business cards and marketing material. Over the past ten years the museum has put on such controversial exhibits/events as: The Art of the Motorcycle¹⁹, Star Wars: The Magic of Myth²⁰, Jacqueline Kennedy: The White House Years²¹, and Metro Squash with Sue^{TM 22}. These exhibits and events were seen by some individuals both within and outside the museum as not directly pertaining to the mission of the museum due to a lack of overt scientific merit. Most of these exhibits are justified by their *social* relevance and hence relevant to anthropological/sociological knowledge of culture.

Funding the museum

While the mission statement is extensive in explaining what the museum is attempting to accomplish, it does not cover the operationalization of its mission. How does the museum maintain all the scholarly research, extensive collections, public outreach programs, exhibitions, and equal educational access while still generating enough income to sustain itself? The role that the museum is attempting to implement through its mission statement often comes into conflict by the means in which the mission is carried out. Staff, collections, exhibitions, educational programs, and physical structure are all components of the museum that require economic capital for sustenance. Funding issues are one of the most important aspects of a museum’s functioning and drives many of the decisions it makes regarding exhibitions, special events, collections management and scientific research. Over time the goals of the museum have shifted with the

¹⁹ Motorcycles was a look back at motorcycles through history and consisted of various motorcycles

²⁰ Star Wars featured costumes from the popular movie trilogy of the same name

²¹ Jackie Kennedy featured the former first lady’s wardrobe

²² Metro Squash with sue was a two day event where a glass squash court was erected in the museum’s main hall and a tournament was held. Inner-city low-income students were brought in to learn about the sport.

changes in administration. With these shifts come strategic initiatives that either support or hinder methods of scientific inquiry.

Discussion and Conclusions

The literature review of this thesis draws upon several Sociological theories as well as Museum Studies literature in order to better understand the processes and outcomes of this particular institution. The main focus in analyzing this particular institution is to highlight the sociological implications behind the formation of scientific knowledge and how it is disseminated to the general public. There is a lack of literature focus on natural history museums within the sociological literature on capital, and scientific knowledge. The data presented here should provide adequate information to support further, more detailed and focused studies in this arena, specifically within the sociological theories presented as well as museum studies literature. An overview of each with relevant points is outlined below.

Conflict Theory: The departmental goals and goals of individuals within vary widely throughout the museum. Each individual Department works to accomplish focused and defined goals with the overall outcome of supporting the museum functioning. Conflict theory that utilizes the cooperation among individuals to accomplish mutually beneficial roles help to define the processes behind how the field museum operates in relation to the formation of scientific knowledge. Individual scientists in the research departments have a focus on specific areas of research with their individual goals to answer specific scientific questions regarding the processes of life and cultures. In order for them to be able to maintain their research programs the institution must continue to function, to generate income and support. Much of this support comes in the form of grants and donations by foundations and individuals. Research programs require a high level of integrity, prestige and interest by outside forces to garner the continued funding that supports the institution, the researcher and the collections. Within the scientific

departments research and knowledge production are the most important aspects of a researcher's career. However, the pressures of administration and business enterprises for 'fundable' and 'popular' exhibits and research can change the direction an individual wants to go. Successful scientific careers evolve out of the ability to manage these various pressures, sometimes giving into popular demand and sometimes maintaining critical focus on less popular and translatable topics with the reward of honor and prestige. This reward does translate into economic support through donations and grants and is thus an important component of the operation of the whole. The differing goals of administration vs. scientific staff discussed here create conflict for both the individual and the departments involved. However, the conflict is useful in the sense that it establishes an environment in which to foster more than one form of capital (economic vs. symbolic, cultural and social). All are important in maintaining the whole.

Actor-Network Theory: As a sociological theory, ANT brings the concept of complexity to the discussion of scientific knowledge formation. Within the framework of a museum with an academic realm, the complexities of how and why specific forms of scientific knowledge are chosen come to light. While Business Enterprises is concerned with income strategies, there is still an underlying responsibility to display current research in the museum regardless of overall popularity or mass appeal. This is especially evident in the necessity to maintain status and reputation. Resulting role conflicts and interconnections of ANT precipitate from how the department operates both within the canons and standards of the scientific community and the expectations of the corporatized museum institution. The overall health of the museum dictates how well this can be achieved and how well the museum operates as an organic entity. When economic stresses change staffing levels and funding, the scientific staff must adapt.

Capital: Ph.D.s, artifacts, fossils, meteorites, plants, animals, publications, media coverage, etc. Many of the forms of capital that the museum relies on for justification of its existence come from the scientific and collections based operations of the museum. Aside from blockbuster exhibits, what does the museum have to offer potential donors in the way of affiliation prestige and community service? While blockbuster exhibits provide income possibilities through admissions and store sales, a more holistic approach to the museum functioning is essential to designating it as more than an amusement park-like attraction. The scientific operations and exhibits are essential to its identity and place in the larger community. Maintaining status and symbolic, social and cultural capital cannot be ignored in deference to the potential economic capital to be gained from blockbuster exhibits and popular topics. Without some sort of distinction from the variety of knowledge forming institutions the impetus behind much of the other forms of funding becomes difficult to procure and maintain. The loss of prestige, and credibility impedes the museum's ability to attract the best curatorial candidates as well as grant funding. One of the biggest factors to symbolic, social and cultural capital is how the economic capital is gained and spent. The corporatization of museum function as described by the museum studies literature is one of the biggest factors that affects the scientific departments of the museum.

Museum Studies: The diagnosis museum studies has to offer sheds light on how museums operate in the 21st century and how they have changed over time. The increasing reliability of corporate strategies plays a major role in how scientific knowledge is disseminated to the general public and what kinds of programs are funded and invested in. A tendency toward overspending

on large projects impacts the ability to continue functioning through difficult economic times due to maintenance of incurred debt and reduced endowments. Maintaining a sustainable budget, where expenditures equal or are less than incomes becomes an issue.

Since the inception of The Field Museum, and specifically within the past 10-12 years, the organizational structure of the museum has experienced a dramatic shift. As illustrated in Table 1, the administration has taken on a more corporate structure with more administrators and vice presidents. It has also dramatically increased the importance of business enterprises as a strategy for increasing visitorship, store sales and income generating events. These operational strategies revolve around blockbuster exhibits, merchandising, and memberships. The Board of Trustees has also been dramatically increased in numbers in order to open the door to greater potential corporate sponsorships. This is part in necessity for operation and part in necessity to pay off debt incurred during a period of deficit spending. Board members are comprised largely of corporate individuals who do not have direct experience with scientific research, the processes behind it or the necessities required to maintain adequate collections care.

In the past three years, The Field Museum has undergone a more specific series of changes that directly impact the research outlined in this thesis. The level of staffing has been significantly reduced in the scientific departments as positions are eliminated through attrition. This has left the scientific areas operating with lowered levels of employees and resources. Curatorial staff has been reduced through attrition to historically low levels. This is part of a strategy to bring the museum to a sustainable level with an emphasis on balancing spending with income. The recent downturn in the economy caused the museum to lose roughly 30% of its endowment making the financial situation even more precarious. Additional efforts are being made to increase private donations and secure grant funding.

During the “corporatization” process The Field Museum spent large amounts of money for capital projects related to essential museum maintenance and nonessential expansion. Some of the projects required additional sources of money that were obtained through the sale of bonds. The Museum currently owes somewhere in the vicinity of \$170 million on bonds. The yearly servicing of bonds puts additional strain on the already strained budget. This is directly related to the necessity to increase private donations and grant funding.

A reliance on grant funding and private donations translates into research programs being increasingly geared towards the interests of donors and the availability of specific types of grants. The interests of the donor come into play when research strategies of the museum are laid out. The Geology Department lost its meteoritics curator in 2006 and the position was frozen indefinitely. However, in 2009 a large donation was made to the museum that established the “Pritzker Center for Meteoritics and Polar Studies”. With it came enough money to endow positions for a curator, collection manager, and adjunct curator of meteoritics. This was not in the department’s strategic planning but because of the funding availability, the opportunity was not overlooked.

Final Note

The Field Museum is a useful case study in the dissemination of scientific knowledge due to the nature of its mission. Through public programs and exhibitions, the museum takes on a role of educator to the public and attempts to universally enlighten the public on matters of current scientific study. The activities of the museum are considered important to public knowledge due to the reputation of the institution and the individuals who conduct research within. Publications

resulting directly from research conducted by museum scientists find their way into both scientific technical journals as well as popular science magazines and television programming.

In 2008 financial shortfalls led to a reduction of nearly 100 staff through early retirement offers, layoffs and attrition. Again in 2010 continued financial struggles caused a further reduction of 50 staff. With financial woes looming and the prospects of possible job loss on the minds of employees, overall morale runs low. Scientific staff members continue to focus on research programs and maintaining the scientific functioning of the museum to ensure that the future of scientific research remains an important part of museum functioning.

The operations of The Field Museum are not unique among this class of institution. Administrative leadership runs across many institutions with some of the same individuals sitting on multiple boards. The corporate style leadership exists within many museums and universities that have also been dealing with financial and budgetary shortfalls in the recent past.

References

- Alexander, Victoria D. 1996. "Pictures at an Exhibition: Conflicting Pressures in Museums and the Display of Art." *The American Journal of Sociology* 101:797-839.
- Ashley, Susan. 2005. "State Authority and the Public Sphere: Ideas on the Changing Role of the Museum as a Canadian Social Institution." *Museum and Society* 3:5-17.
- Barnes, Barry. 1974. *Scientific Knowledge and Sociological Theory*. London: Routledge & Kegan Paul Ltd.
- Barr, Jean. 2005. "Dumbing Down Intellectual Culture: Frank Furedi, Lifelong learning and Museums." *Museum and Society* 3:98-114.
- Bates, F. L. 1962. "Some Observations concerning the Structural Aspect of Role Conflict." *The Pacific Sociological Review* 5:75-82.
- Becker, Howard. 1952. "Science, Culture, and Society." *Philosophy of Science* 19:273-287.
- Bloor, David. 1996. "Idealism and the Sociology of Knowledge." *Social Studies of Science* 26:839-856.
- Bosch, Annette van den. 2005. "Museums: Constructing a Public Culture in the Global Age." *Third Text* 19:81-89.
- Bourdieu, Pierre. 1979. *Distinction: A Social Critique of the Judgement of Taste*. Cambridge, MA: Harvard University Press.
- Bourdieu, Pierre. 1977. *Outline of a Theory of Practice*. Cambridge University Press.
- Bourdieu, Pierre. 1989. "Social Space and Symbolic Power." *Sociological Theory* 7:14-25.
- Bourdieu, Pierre. 1993. *The Field of Cultural Production*. New York, NY: Columbia University Press.
- Bourdieu, Pierre. 2001. "The Forms of Capital." Pp. 96-111 in *The Sociology of Economic Life*. Boulder, CO: Westview Press.
- Bourdieu, Pierre. 1992. *The Logic of Practice*. 1st ed. Stanford University Press.
- Callon, Michel, and John Law. 1997. "After the Individual in Society: Lessons on Collectivity from Science, Technology and Society." *Canadian Journal of Sociology* 22:165-182.
- Callon, Michel, and John Law. 1982. "On Interests and Their Transformation: Enrolment and Counter-Enrolment." *Social Studies of Science* 12:615-625.

- Clifford, James. 1993. "On Collecting Art and Culture." Pp. 49-73 in *The Cultural Studies Reader*. London and New York: Routledge.
- Collins, H. M. 1982. *Sociology of Scientific Knowledge: a source book*. Claverton Down; Bath; Avon; England: Bath University Press.
- Conn, Steven. 2004. "Field Museum." in *The Encyclopedia of Chicago*. Chicago, IL: University of Chicago Press.
- Dalton, Rex. 2008. "Downturn hits Chicago's natural history museum." *Nature News*.
- Deleuze, Gilles, and Felix Guatari. 1987. *A thousand Plateaus: capitalism and schizophrenia*. Minneapolis, MN: University of Minnesota Press.
- Foucault, Michel. 1972. *The Archaeology of Knowledge and the Discourse on Language*. New York, NY: Pantheon Books.
- Gould, Stephen Jay. 2000. *The Lying Stones of Marrakech: Penultimate Reflections in Natural History*. New York, NY: Harmony Books.
- Hooper-Greenhil. 1992. *Museums and the Shaping of Knowledge*. 1st ed. Routledge.
- Kilzer, Ernest, and Eva J Ross. 1953. "The Sociology of Knowledge." *The American Catholic Sociological Review* 14:230-233.
- Kotler, Neil G., and Philip Kotler. 1998. *Museum Strategy and Marketing : Designing Missions, Building Audiences, Generating Revenue and Resources*. Jossey-Bass.
- Lamont, Michel, and Marcel Fournier. 1992. *Cultivating Differences: Symbolic Boundaries and the making of Inequality*. Chicago, IL: University of Chicago Press.
- Latour, Bruno. 1999. "On Recalling ANT." Pp. 15-25 in *Actor Network Theory and After*. Oxford [England]: Blackwell Publishers.
- Laulicht, Jerome. 1955. "Role Conflict, the Pattern Variable Theory, and Scalogram Analysis." *Social Forces* 33:250-254.
- Law, John. 1999. "After ANT: complexity, naming and topology." Pp. 1-14 in *Actor Network Theory and After*. Oxford [England]: Blackwell Publishers.
- Law, John, and John Hassard. 1999. *Actor Network theory and After*. Oxford [England]: Blackwell Publishers.
- Levine, Lawrence. 1988. *Highbrow/Lowbrow: The emergence of cultural Hierarchy in america*. Cambridge, MA: Harvard University Press.

- Lynch, William T. 1994. "Ideology and the Sociology of Scientific Knowledge." *Social Studies of Science* 24:197-227.
- MacCannell, Dean. 2002. "The Ego Factor in Tourism." *The Journal of Consumer Research* 29:146-151.
- Macdonald, Sharon. 1990. "Posing Questions about the Purposes of Museums." *Current Anthropology* 31:225-228.
- Mathur, Saloni. 2005. "Museums and Globalization." *Anthropological Quarterly* 78:697-708.
- McAlister, Melani. 1996. "'The Common Heritage of Mankind': Race, Nation, and Masculinity in the King Tut Exhibit." *Representations* 80-103.
- Mitchell, W. J. T. 1998. *The Last Dinosaur Book*. Chicago, IL: The University of Chicago Press.
- Nash, Stephen E., and Gary M. Feinman. 2003. "Curators, Collections, and Contexts: Anthropology at the Field Museum, 1893-2002." *Fieldiana New Series*.
- Patterson, Bruce D., Ellis J. Neiburger, and Samuel M. Kasiki. 2003. "Tooth Breakage and Dental Disease as Causes of Carnivore -- Human Conflicts." *Journal of Mammalogy* 84:190-196.
- Pearce, Jone L. 1981. "Bringing Some Clarity to Role Ambiguity Research." *The Academy of Management Review* 6:665-674.
- Peterhans, Julian C. Kerbis, and Chapurukha M. Kusimba. 1998. "Man-Eaters of Tsavo.." *Natural History* 107:12.
- Pruitt, Dean G. 1992. "Social Psychological Perspectives on the Behavioral Model." *Journal of Organizational Behavior* 13:297-301.
- Rader, Karen, and Victoria Cain. 2008. "From Natural History to Science: display and the transformation of American museums of science and nature." *Museum and Society* 6:152-171.
- Rosen, Judith. 2006. "New Look at Art Museum Stores: An Emphasis on integrating stores into the Museum Experience Contributes to Changes in Retailing." *Publishers Weekly* 35-36.
- Ross, Max. 2004. "Interpreting the New Museology." *Museum and Society* 2:84-103.
- Sanz, Jose Louis. 2002. *Starring T. Res: Dinosaur Mythology and Popular Culture*. Bloomington, IN: Indiana University Press.
- Skramstad, Harold. 2000. "The Mission of the Industrial Museum in the Postindustrial Age." *The*

Public Historian 22:25-32.

Stark, David. 2001. "Review: Actor Network Theory and After." *Contemporary Sociology* 30:96-97.

Swidler, Ann, and Jorge Ardití. 1994. "The New Sociology of Knowledge." *Annual Review of Sociology* 20:305-329.

Van Doren, Charles. 1992. *A History of Knowledge: the pivotal events, people, and achievements of world history*. New York, NY: Ballantine Books.

Wolverton, Mimi, Marvin L Wolverton, and Walter H Gmelch. 1999. "The Impact of Role Conflict and Ambiguity on Academic Deans." *The Journal of Higher Education* 70:80-106.

Yeakel, Justin D. et al. 2009. "Cooperation and individuality among man-eating lions." *Proceedings of the National Academy of Sciences* 106:19040-19043.

Ylikoski, Petri. 2004. "Interests, Folk Psychology and the Sociology of Scientific Knowledge." *Philosophical Explorations* 7:265-279.

Yount, Sylvia. 2001. "Braving (And Bridging) the Great Divide: The Academy and the Museum." *American Art* 15:2-7.

Zolberg, Vera L. 1981. "Conflicting Visions in American Art Museums." *Theory and Society* 10:103-125.

Appendicies

Appendix A: Official Mission Statement of The Field Museum posted 1992

Preamble: Serving The Public As Educator

The Field Museum is an educational institution concerned with the diversity and relationships in nature and among cultures. It provides collection-based research and learning for greater public understanding and appreciation of the world in which we live. Its collections, public learning programs, and research are inseparably linked to serve a diverse public of varied ages, backgrounds and knowledge.

Subject Matter Focus: Living Together On The Living Earth

Combining the fields of Anthropology, Botany, Geology, Paleontology and Zoology, the Museum uses an interdisciplinary approach to increasing knowledge about the past, present and future of the physical earth, its plants, animals, people, and their cultures. In doing so, it seeks to uncover the extent and character of biological and cultural diversity, similarities and interdependencies so that we may better understand, respect, and celebrate nature and other people.

Collections: World-Wide Knowledge Database

The Museum holds encyclopedic collections of biological and geological specimens and cultural objects as the data needed to understand the nature of - and conditions affecting - environmental and cultural change. In support of these collections, we also hold significant collections of books, periodicals, photographs, illustrations, computer data, archival and instructional material. Like a great research library, our collections of more than 20 million items are a crucial part of the world's knowledge database for the sciences, humanities and the arts. The Museum holds the collections in trust for future generations. Over time, new knowledge is gleaned from the collections. Accordingly, the Museum must manage the collections to provide for both long-term conservation and access and make strategic additions to the collections pursuant to clearly defined objectives. In discharging its collection trusteeship, the Museum recognizes the special relationship it has with the people whose cultures and habitats are represented in the collections. We will nurture these special relationships so together we can enhance greater understanding of cultural traditions and environmental surroundings for the benefit of all humankind.

Public Learning: Offering Greater Understanding About Environments And People

Unlike schooling, learning in a museum is self-motivated, self-directed, and can be lifelong. Unlike print and electronic media, information is communicated primarily through real, tangible objects. Museum learning usually takes place during leisure time and without the direction of a teacher. The exhibit is the principal avenue of learning. Exhibits are augmented by people-mediated programs and a visitor-oriented museum-wide staff which reaches out to assist all visitors. Services to schools and communities extend the museum experience to people beyond our walls. To stimulate a public sense of inquiry, curiosity and delight, our exhibits and programs are not only informative, but also entertaining and inspiring. We focus on critical environmental and cultural issues which are engaging and relevant to the public's daily lives and civic

responsibilities. We must be a vital educational and recreational destination for both our local and world-wide communities.

Research: Explaining The Patterns And Processes That Shape The Living Earth

The Museum maintains a vital program of basic research that continually stimulates active and pioneering uses of the collections. Seeking new knowledge and deriving new syntheses about the dynamic physical, biological and cultural patterns and processes that shape the living earth, Museum research centers on anthropology and the natural sciences of evolutionary and environmental biology and geology. All of the research programs are focused on the interrelationships among the earth, its environments, life and cultures and how they change over time. Our research methods use advanced technologies and encourage an interdisciplinary approach which combines the Museum's disciplinary breadth and small research staff into a uniquely imaginative and focused whole. Our basic research has direct linkages to research about conservational, ecological, biomedical and multicultural issues. The Museum and its staff communicate our research findings and ideas about the history of the planet by means of scholarly and general papers, oral presentations to scientific and public audiences, public exhibits and other learning programs.

Publics: Reaching Out

Field Museum serves diverse publics ranging from children, adults and families to the national and international research community. We reach out to our diverse publics and their changing educational needs. We have a special responsibility to reach out to the people of Chicago, neighboring communities and the State of Illinois. Our visitors should reflect the cultural, educational and economic diversity of the Chicago metropolitan area. We must work collaboratively and sensitively with the people in our locality, country and world whose cultures and habitats are represented in our collections, research and public programs. In reaching out, the Museum must build on its long-standing tradition of "outreach" which takes its resources and programs to schools, parks, and communities.

Linkages: Working With Others

The Field Museum is a unique educational institution in a network of nearby and international educational institutions. We must work closely with neighboring schools, colleges, universities and research institutions to strengthen the quality and effectiveness of our collection-based research and public learning. We need to collaborate with other museums, environmental, cultural and recreational groups and organizations to fulfill our educational mission. The Museum has an obligation to seek out and collaborate with researchers and teachers who reside in the areas from which our collections come.

Center Of Understanding And Mutual Respect: Listening To Each Other

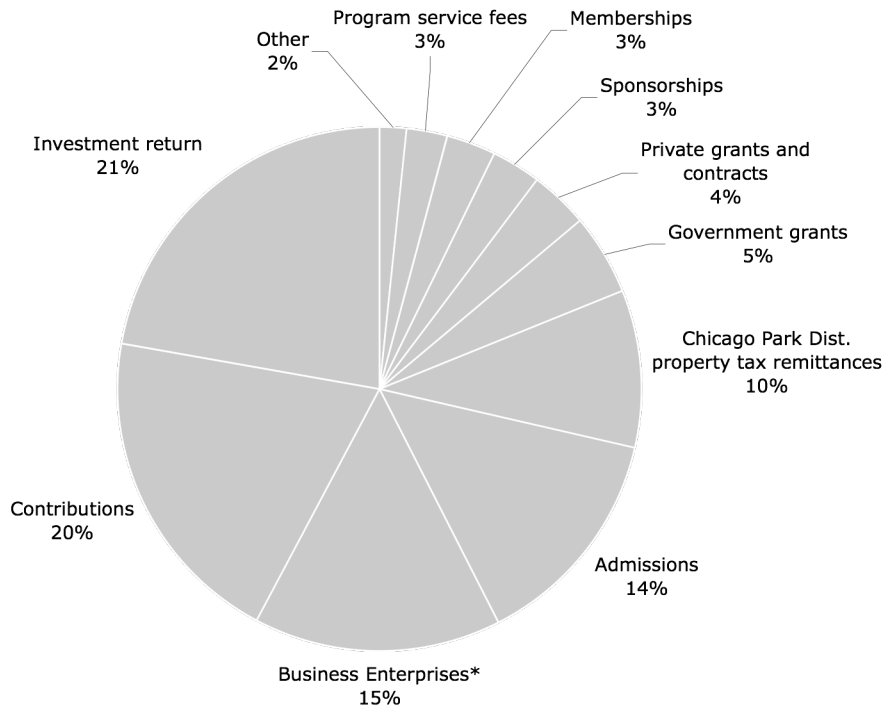
The Museum subject matter directly relates to the great issues of the present and future: environmental and cultural diversity and their interrelationships. There are differing scholarly and public viewpoints on these concerns. While the Museum does not take institutional positions on these issues, it must serve as a center of free inquiry, a marketplace for multiple points of view on these matters. In doing so it serves as a forum where relevant controversy can be aired. In this way the Museum can be a "door in the wall" of our differences and inspire greater knowledge, understanding and respect for our varied natural environments and cultural heritages.

Public Service: Our Commitment

We - the trustees, staff and volunteers of The Field Museum - are dedicated to public service. Together and individually we share a commitment to provide services and opportunities to our many publics. As an institution devoted to the study of diversity and relationships, we will practice diversity in our public contacts and staffing. We will nurture an environment of mutual respect which will extend to the public we serve. We will act ethically in our relations with the public and with each other. Collectively and individually we are committed to the mission of the Museum and our public service responsibilities.

Approved by the Board of Trustees June 15, 1992

Appendix B: Field Museum revenue distribution for the year 2007



Source:

Appendix C: Additional natural history and other museums visited

Los Angeles County Museum – Los Angeles, CA

Denver Museum of Natural Sciences – Denver, CO

Ottawa Museum of Natural History - Ottawa, ON Canada

Royal Tyrell Museum of Natural History – Toronto, ON Canada

Grand Rapids Public Museum - Grand Rapids, MI

Sam Noble Museum – Oklahoma City, OK

American Museum of Natural History – New York, NY

Milwaukee Public Museum – Milwaukee, WI

California Academy of Sciences – San Francisco, CA

Indianapolis State Museum – Indianapolis, IN

Natural History Museum – London, UK

San Diego Natural History Museum – San Diego, CA

Appendix D: Cost of Admissions to The Field Museum

The Field Museum provides 52 free days per year. The ‘free’ day applies to basic admission only. Access to any special exhibits or ticketed attractions requires purchase of tickets.

Cost breakdown of ticketing levels as of summer 2010 fall into the categories as follows:

All Access Pass: entry to all exhibitions, special exhibits, 3D theater and Underground Adventure

	Regular	Chicago Citizens
Adults	\$28.00	\$24.00
Children (3-11)	\$19.00	\$15.00
Students	\$23.00	\$19.00
Seniors (65+)	\$23.00	\$19.00

Discovery Pass: One special exhibit entry *or* 3D theater *or* Underground Adventure plus basic admission access

	Regular	Chicago citizens
Adults	\$22.00	\$19.00
Children (3-11)	\$15.00	\$12.00
Students	\$18.00	\$15.00
Seniors (65+)	\$18.00	\$15.00

Basic Admission: entry to museum including non-ticketed exhibits and attractions

	Regular	Chicago citizens
Adults	\$15.00	\$13.00
Children (3-11)	\$10.00	\$8.00
Students	\$12.00	\$10.00
Seniors (65+)	\$12.00	\$10.00

Membership: unlimited admission to the museum, and a limited number of free passes to selected special exhibitions throughout the year

Individual	\$80 for 1 year, \$150 for 2 years
Family	\$100 for 1 year, \$190 for 2 years
Family Plus	\$125 for 1 year, \$240 for 2 years
Students, Seniors, National Affiliates	\$60 for 1 year, \$110 for 2 years