

**THE
EXPLORATION
ZONE
at The Field Museum**



**Front End
Evaluation**

November 1995

**= Selinda Research Associates =
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EXECUTIVE SUMMARY

This evaluation study examined Field Museum visitors' understandings of the research science that goes on behind-the-scenes. We conducted over 125 depth interviews with visitors, members, and museum staff, for a total of approximately 50 contact hours with respondents from May - September, 1995. Following is a brief overview of our primary findings.

1. Visitors seemed to think about what goes on behind-the-scenes at The Field Museum primarily in terms of exhibits rather than the scientific research that is conducted.
2. A seven-level knowledge hierarchy was constructed which revealed a range of visitor understandings about the scientific research.
3. Most visitors indicated they were at Levels Zero, One, and Two, suggesting they don't think very much or very accurately about the scientific research that goes on. This was not something that most visitors we spoke with were very curious about on their own.
4. Most visitors did not understand that The Field Museum employs a large staff of full-time scientists whose primary role is to conduct research.
5. Visitors tended to think of The Field Museum as dealing with history, cultures, and people rather than as a science museum. They tended to associate science with technology, physics, and chemistry.
6. Visitors tended to underestimate the size of the collections, and overestimate the percentage of the collection on display. They also tended to overestimate the number of reproductions, and often wondered if something was real.
7. Visitors demonstrated a wide range of understandings about how the museum acquires its objects. Most of these understandings were reasonable conjectures, and grounded in some degree of truth, although their understandings were almost always an incomplete portrayal.
8. Some scientific and museum terminology was particularly confusing to visitors.
9. Visitors indicated varying amounts of interest in science in their personal lives, but indicated a number of possible connections with some of the scientists' stories.
10. Having dead animals on display seemed to be a particularly sensitive issue to some visitors. There was some indication that study mounts were more disturbing than more realistic diorama mounts.
11. Visitors shared interesting questions they have about what goes on behind-the-scenes, but this needs further research. Most questions focused on exhibits rather than science.

INTRODUCTION

Located in Chicago, The Field Museum is a large research and collecting institution which focuses on the study and exhibition of “the Earth and its people.” As such, it employs a large staff of research scientists who conduct studies covering a wide range of topics and issues. Divided into four academic departments—zoology, botany, geology, and anthropology—most research focuses on systematics.

The Exploration Zone is an exhibition—currently in the pre-planning stages—that deals with the scientific research that goes on behind the scenes at the museum. Although the goals of the exhibit continue to be developed and refined, they deal with three broad issues:

- To demonstrate that The Field Museum is a science museum, with scientists who do research.
- To answer the question, “Why should I care (about the first goal)?”
- To show how The Field Museum scientists help all of us understand the complexities of the natural world and human cultures.

This research report presents findings from an extensive front-end evaluation of visitors’ understandings of the scientific research that goes on behind the scenes at The Field Museum. How do they think about what goes on behind the scenes? To what extent are they aware that the museum is a scientific research institution? What questions do visitors have about what goes on behind the scenes? How do they think about the study of the collections? What is their understanding of scientific—and more specifically systematics—research? And more generally, what meaning does science have for them in their lives?

In order to get at these issues, the data collection focused on two major questions:

How do museum visitors understand and think about the science that goes on behind-the-scenes at The Field Museum?

In what ways do visitors understand science and scientific research and how does it fit into their lives?

The remainder of the report describes in detail the process we used to answer these and other related questions that emerged during the course of our research, and the results we found.

METHODOLOGY

There is often confusion about the difference between research methods and methodology (Harding, 1987). In this report, we refer to *methods* as those specific techniques we employed in order to collect data. In this project they included conducting depth interviews with a wide range of respondents, and reviewing existing documents, evaluation reports, and research articles. We also attended and participated in many exhibit development team meetings.

Methodology however, refers to the underlying structure or framework within which the study was conducted.

A methodology is a theory and analysis of how research does or should proceed; it includes accounts of how “the general structure of theory finds its application in particular scientific disciplines.” (Harding, 1987, p.3)

This study employed a naturalistic methodology (Lincoln & Guba, 1985). This methodology is grounded in the belief that the best way to study a particular research question is to look at many aspects of it in as much detail as possible in the natural setting. The purpose of naturalistic inquiry is understanding, while more traditional research is often based on prediction and control. Naturalistic inquiry is based on the assumption that if we can understand our environment—or the particular phenomenon under investigation—in as complete a way as possible, we will be able to make better judgments about what applies in another situation.

Naturalistic Evaluation takes a broad, holistic view of the program, exhibit or institution being studied, is more interpretative than judgmental, and requires participation from a wide range of people who are to be served by the study effort....Thus, Naturalistic Evaluation is directed toward a search for meaning.

And it is this search for meaning that distinguishes Naturalistic Evaluation from other field oriented evaluation strategies....The purpose is to uncover the multiple realities and multiple perspectives that exist and are provoked as people experience the museum environment—it reveals the configuration of meaning that emerges when different people are exposed to a common stimulus. (Wolf & Tymitz, nd., p. 2-3)

Methods

The Sources of Data

As described above, the data for this study came from a variety of sources, but primarily face-to-face depth interviews with casual museum visitors, museum members, museum scientists, and exhibit facilitators. A total of 126 depth interviews were conducted, each ranging from 20 minutes to 1½ hours for a total of approximately 49 hours of conversations with respondents.

All but one of the interviews with casual visitors, scientists, and facilitators were conducted face-to-face. The interviews with museum members and one facilitator were conducted over the telephone. Most respondents gave their permission to have the conversations tape recorded. Most tape recorded interviews were later transcribed.

In addition, the data collectors attended and participated in more than 15 project meetings over a period of five months, and reviewed 25 written documents covering a range of topics related to this study. See Appendix A for a detailed breakdown of the sources of data for this study. All data was collected from May - September 1995.

Selecting the Respondents

Using purposive sampling methodology (Lincoln & Guba, 1985), the casual visitors, scientists, and facilitators were selected to represent as wide a range of respondents as possible including age, gender, race, experience and background with science and with the museum, and (with casual visitors) configuration of the social group with whom they were visiting.

Casual Visitors

To conduct the interviews with the casual visitors, we set up a table in the museum's Searle Lounge on the second floor, and offered visitors a small gift (a fossil or an item from the gift shop) in exchange for participating in an interview with us. Visitors were either approached and invited to participate, or they approached us and asked to participate. Sometimes interviews were conducted with a single respondent and sometimes all the members of a social group participated. Depth interviews usually lasted around 20 minutes and were conducted with 101 casual visitor groups.

Museum Scientists

Interviews with museum scientists were conducted in their offices and laboratories. In addition to talking with us about the kinds of things they do at The Field Museum, they often demonstrated tools, showed off specimens, and used other props to demonstrate their research. These conversations tended to last approximately an hour. Interviews were with research scientists as well as collections managers, and included individuals from all four departments. Nine scientist interviews were conducted.

Museum Facilitators

Museum facilitators at The Field Museum function primarily as on-the-floor interpreters. The facilitators we spoke with had all been volunteers at the museum for an extended period of time, and had interacted in different capacities and in a variety of settings with the visiting public. This afforded them many opportunities to interact with and observe visitors to the museum. They were selected because it was believed they could offer insights into visitor behaviors within the context of museum exhibits, in addition to a unique perspective on visitors' understandings of what goes on behind the scenes.

Interviews with volunteer facilitators were held in various locations including the Volunteer Lounge, our office at The Field Museum, and over the phone. These interviews lasted approximately half an hour. We conducted four facilitator interviews.

Museum Members

Member interviews were conducted over the phone. These conversations lasted approximately half an hour. Respondents came from a randomly generated list. Twelve member interviews were conducted.

The Interview Protocol

Naturalistic inquiry is based on building an intimacy with the respondents which allows them to talk frankly and openly about the subject matter, and give a more honest rather than canned or cued response. Although we relied on a pre-determined interview protocol to focus the interview, we did not ask any set group of questions. Instead our intent was to get the answers to the two research questions mentioned above by approaching the issues from as many different routes as was necessary, listening carefully to the words the visitors used and the ways they described their understandings. The conversations often went in unanticipated directions and yielded rich and interesting information that we would otherwise have missed.

A separate interview protocol was developed for each of the four types of respondents (see Appendix B for sample protocols).

During the interviews with casual visitors we usually asked the respondents to participate in a card sort activity. We gave them a pile of approximately 25-30 3x5 cards with various words written on them (see Appendix C) and asked them to sort them into whatever categories they wanted to. We stressed that there were no right or wrong answers, and that if they weren't familiar with any word they could put it on the side. This was followed up with a discussion about the various piles and what they were thinking about as they engaged in the activity. During the 2 months of data collection, a few cards were added and a few were removed to elicit more meaningful responses from the visitors.

The Data Collectors

There were four data collectors with varying degrees, backgrounds, and experience in depth interviewing. Backgrounds included work in social welfare, classroom teaching, and time spent as a volunteer on an emergency hotline. All of the four data collectors were trained in naturalistic inquiry and methodology.

HOW DO VISITORS THINK ABOUT WHAT GOES ON BEHIND-THE-SCENES?

In conducting this research study many interesting themes emerged from the data. The following section describes each of these themes in some detail, including comments from the interviews to illustrate various points.

It should be understood that the number of quotes selected is not representative of the number of respondents who expressed a particular sentiment. Sometimes a pervasive theme was repeatedly mentioned by many respondents but was never articulated very clearly; at other times, a relatively minor point was described in a variety of thoughtful and interesting ways. When selecting quotes to use, we chose those that were clearly stated and that illuminated the range of visitor understandings. Consequently, some points which were not mentioned very often are illustrated by a number of quotes, whereas a much more pervasive theme might be exemplified by only one or two. When appropriate, we refer to quantities of visitors who held a particular viewpoint with the words *all, most, many, some, few, and none*.

Overview of Findings

Not surprisingly, as we collected our data, it quickly became apparent that most visitors' primary way of thinking about The Field Museum was through the exhibits. When visitors talked about what goes on behind-the-scenes they tended to talk about exhibit development, fabrication, and maintenance. They talked about objects being kept in storage because there wasn't enough room to have them all on display; they talked of the purpose of collecting as being to find interesting things to show the public. It became clear that the visitors we talked with overwhelmingly perceived The Field Museum as a place to display interesting things and teach the public about them, as opposed to being a research institution. One visitor even talked about how the role of The Field Museum has changed over the years.

I think [the primary goal of The Field Museum] used to be research. I think that's what they started off as. And then they made a museum to be able to—I think it was probably just like members were allowed to come in or something like that. And then all of a sudden it boomed and museums were a good thing. Maybe it was for the World Exposition. I don't know. They decided, okay, we're going to open up our doors. And then it became the primary goal I think to inform. And they were noticing that the easiest way to do it is to also entertain. And museums have become very entertaining....I think they put a lot of work into being accessible for younger kinds of people. (072703)

It appears from the data we collected that The Field Museum has done an excellent job communicating its educational mission to the public. On the other hand, visitors appeared to have little understanding of the research function of the museum.

One of the main purposes of this evaluation study was to identify and describe the various ways in which visitors understand and think about the research that goes on behind-the-scenes at The Field Museum. A useful way of describing data such as this is through the development of a *knowledge hierarchy* (Perry, 1989, 1993).

The Knowledge Hierarchy

A knowledge hierarchy is a technique for presenting a range of visitor understandings about a certain topic. It emerges from the data including, in this case, visitor interviews, interviews with scientists, volunteer exhibit facilitators, and museum members, and our participation in exhibit development team meetings.

The knowledge hierarchy assessment technique is based on the assumption that inherent in each exhibit is an internal knowledge structure. This knowledge structure is at the intersection of the exhibit developer's, and the visitor's, organization and understanding of the topic. A knowledge hierarchy is simply a description of this range of understandings. It is not the range of knowledge visitors have about a topic, but the range of knowledge within the context of the exhibit. (Perry, 1993, p.73)

A knowledge hierarchy usually describes six or seven levels of understanding which characterize the full range of how visitors think about a topic, usually by increasing levels of sophistication. It does not identify the number of visitors in each category; instead it represents, in a manageable form, virtually all visitors' understandings. As such, it is a powerful tool for museums, especially those institutions concerned with reaching multiple audiences, inter-generational social groups, and traditionally underserved populations. It is a way of helping us address the needs and interests of a much greater proportion of our audiences. When we try to appeal to 50%, 75%, or even 90% of our visitors we often forget that that leaves 10% or more unaccounted for. And even 10% of our populations is a large number. The goal of a knowledge hierarchy therefore is not to figure out how many of our visitors have each level of understanding, but to recognize that we have at least some visitors at all levels, and to understand what those levels are.

The following knowledge hierarchy was constructed by the evaluation team in collaboration with the exhibit development team. It does not represent all or even the majority of what visitors believe goes on behind-the-scenes at The Field Museum. As stated in the quote above, it represents the range of visitor understandings *within the context of the exhibit*. Because this exhibit is about the research science that goes on behind-the-scenes, that is the focus of this knowledge hierarchy.

Visitor Understanding of Scientific Research at The Field Museum

- 0 “Don’t know, don’t care.”
These visitors have little prior knowledge about and/or interest in what goes on behind-the-scenes at The Field Museum. They have not thought about it in any great detail. It is not something that they are naturally curious about. Visitors at this level are not necessarily

not interested in what goes on behind-the-scenes; it is just that they haven't thought much about it, and that they are not particularly curious on their own.

- 1** "I don't know, but I'm curious." "I was wondering about that."
Visitors at Level One don't know what goes on behind-the-scenes, but they are curious. As they wander through the exhibits, they might be wondering about how exhibits are made, or where the collections come from.
- 2** These visitors are interested enough that they have developed a theory or hypothesis about what goes on behind-the-scenes. Although often reasonable, their understanding is incorrect or incomplete. These visitors may believe, for example, that the primary role of scientists is exhibit development, or giving tours to visitors. These visitors don't understand or fully appreciate the active research and collecting function of the museum.
- 3** Level Three visitors have a very basic understanding that a primary activity of The Field Museum is to work with research scientists, including those on staff as well as visiting scientists.
- 4** These visitors understand that The Field Museum employs many full-time scientists whose primary role and responsibility is to conduct research.
- 5** These visitors understand that the many scientists employed by The Field Museum are working on their own original research, and are creating new knowledge, "writing the books others use."
- 6** Level Six visitors include all those who have a more sophisticated understanding and appreciation of the research science that goes on behind-the-scenes at The Field Museum. They may understand that many scientists are conducting systematics research. They may understand that the research scientists are organized into four academic departments similar to a university. They may understand that even though scientists are employed in a particular department, there is a significant amount of cross-disciplinary research going on.

Level Zero

As we talked with casual visitors to the museum we found individuals characteristic of each of the seven levels of the hierarchy. What was surprising to us during our data collection, was the large proportion of visitors who indicated they were at Level Zero. Most visitors indicated they rarely thought about what goes on behind-the-scenes. They indicated this in numerous ways, including answering questions in vague terms or in a hesitant manner, contradicting themselves, changing their stories as they were talking, or actively engaging in speculation. Some openly admitted they were not interested, or that this was the first time they had thought about these issues. The following are only a very small sampling of Level Zero responses.

Now you have totally [sur]passed my thought process. [When I'm walking through the exhibits] I'm going "Oh, cool stuff." (072601)

There's so much on display that your curiosity is already overwhelmed....I really didn't give too much thought about what happens behind-the-scenes. (073102)

I don't care how [this stuff] got here, to tell you the truth....I really don't. (072002)

Level One

Although many visitors didn't seem to wonder very much about what goes on behind-the-scenes, some visitors appeared more curious. They indicated they were at Level One of the hierarchy, that as they look at exhibits, they wonder about what goes on behind-the-scenes.

I think because I've been here several times, it's kind of occurred to me...what do they do behind that door? (071803)

How do they find mummies and stuff? (081605)

While many visitors indicated that they had not wondered much about what goes on behind-the-scenes, it was encouraging to note that many of these visitors quickly "jumped a level" to Level One understanding. When we asked them what they thought went on behind-the-scenes, many of them indicated they had never thought about it before, but that now they were curious.

*Where **do** they get all this stuff? (080103)*

That's a good question. (082503)

I don't know. A good question. (071702)

Level Two

When pushed further, most visitors we spoke with were able to develop reasonable hypotheses about what goes on behind-the-scenes, talking of a wide range of possibilities from exhibit development, to care and storage of the collections, to some research on the collections. This supports the findings of two recent research studies at the Smithsonian where visitors correctly identified a wide range of behind-the-scenes activities of the professional staff (Ziebarth, Smith, Doering, Pekarik, 1995; Bielick, Pekarik, Doering, 1995). However, most of the speculations of the visitors we spoke with were not very thorough or complete. Explanations usually portrayed only one small aspect of what goes on behind-the-scenes. When they talked about behind-the-scenes, visitors often spoke of exhibit planning meetings, and the repair of objects so they could be returned to display. Some mentioned scientists who might consult on exhibit development teams. They illuminated many incomplete understandings and/or misconceptions about The Field Museum.

[The botanists and zoologists on staff do] research in order to put an exhibit together. (080205)

[The archaeologists are] not necessarily employed by the museum. They probably do free lance work. (080203)

It is important to remember that most of the visitors who reached a Level Two understanding did so only after significant questioning. Although some visitors appeared to already be at the second level, most we spoke with seemed to arrive there only as a result of the interview questions. It cannot be assumed that very many visitors come to the museum with this level of understanding. However, it was encouraging that most visitors tended to readily volunteer reasonable and at least partially accurate hypotheses.

Level Three

Some visitors we spoke with indicated a Level Three understanding by talking about the research work The Field Museum is doing with research scientists. Although they tended to still think the a primary role of the museum is exhibits, they also spoke of research being done. They often talked of scientists from other institutions doing research in collaboration with The Field Museum or on The Field Museum collections.

There has to be some research done, and they need scientists for this, or people to research different things. (071701)

This is affiliated with the university... So these people that are coming here [from the university]...would study [the artifacts] here, and then go out there where they were living and growing to see what they eat, how they live and how many are there. [They would] study the environment of their particular species....[These are] students that come here to study. They are like an internship. (071301)

This third level of the hierarchy seemed to be the ceiling on most visitors' understandings and speculations.

Level Four

A relatively small number of visitors indicated a Level Four understanding. They talked about the large amount of research being done at The Field Museum and that The Field Museum employs many full-time research scientists.

I would imagine here you have anthropologists, ethnologists. You probably have paleontologists. You probably have geologists. And then you probably have like biologists. And there's gotta be like other people. (080101)

Level Five

Some visitors indicated they had a Level Five understanding. They talked about the original research that is conducted by scientists who work for the museum.

I'm aware that The Field Museum has a back-up staff. I mean, my own area of research training was in primate behavior. And I know Jack Fuden—I think it's

Fuden, maybe it's Foden—has published a lot of monographs on primate species, and Hirshkovitz' volume on the world primates is a classic. (081402)

Level Six

A few visitors indicated a much more complete and sophisticated understanding of the research science that goes on behind-the-scenes. These visitors often were able to talk about the way the third floor is divided into academic disciplines similar to a university, or better than a university because you wouldn't have to teach. Others talked of systematics, or of the cross-disciplinary aspect of much of the research. Although only very few visitors indicated a Level Six understanding of what goes on behind-the-scenes at The Field Museum, those who did tended to speak quite articulately.

[The Field Museum scientists are studying] all the various types of things that are on display. Some study geology; some study archaeology; botany. Maybe there's new plants that are developing. [They're studying] the whole evolution of mankind and of the world....People that study geology, volcanoes....part of their study is to document their findings and record it for later people to read what they wrote and then maybe take it to the next step. (073102)

There are people [at The Field Museum] who are spending their lifetimes doing taxonomic work which most people would probably find pretty esoteric. Nonetheless, it's necessary work. You know, it's work that I think science requires if it's going to be of service. (081402)

And part of [what The Field Museum scientists are doing] probably is trying to figure out a system of classification that allows people to see that the thing works, either as an evolutionary system or as a moment of diversity for social scientists. (080101)

Summary

Overall it appears from the data and the knowledge hierarchy that most of the casual visitors we spoke with didn't think a whole lot about the scientific research that goes on behind-the-scenes. They seemed to become interested in certain aspects of behind-the-scenes such as the origins of collections, and exhibit development, fabrication, and maintenance. There was less indication that they were naturally inclined to become curious about the research. Although we talked with visitors who represented all seven levels of the hierarchy, it was clear that most visitors were at Levels Zero, One, and Two, and that the ceiling for discussing behind-the-scenes research with most visitors was Level Three.

The knowledge hierarchy is a useful tool for describing the range of visitor understandings along one particular continuum. However, it doesn't describe in very much detail the many other ways visitors think about what goes on behind-the-scenes at The Field Museum. In the remainder of this section we will present some additional themes that emerged during our conversations with visitors and related data collection.

Scientists Who Work At The Field Museum

While talking with visitors to The Field Museum we found a number of perceptions about the types of professions that are represented on staff at the museum. As described above, the majority of visitors did not seem to know that there are many scientists who work at the museum in a research capacity. Despite the museum's attempts to publicize this fact, this was not information most visitors appeared to know. What the majority of visitors did offer were a wide-ranging series of speculations concerning scientist involvement with the museum. In this section we will describe some of the ways visitors talked about the scientists who might work at The Field Museum.

One impression that appeared to be shared by many visitors was that scientists who work at The Field Museum are affiliated with local Chicago universities. While this is true in a number of cases, these visitors tended to apply this to Field Museum scientists universally. Interestingly, their explanations were often fiscal.

I would guess that [scientists are affiliated with a university.] I don't know that that's true. You've got to make a living some place. I don't think [The Field Museum has] a lot of money....Maybe they do. Maybe there is some scam going on here that we don't know about. They're always begging for money. (071301)

I don't know how many of [the scientists] would be working here. I have no idea. Most of them probably are attached to academic institutions, and you use their expertise or you wouldn't be able to afford to run the place, quite frankly. (071801)

Some visitors said that the only involvement university scientists have with the museum is in using the museum collections for research specimens.

I would say [scientists] come here and study [the collections] and then go to the university and teach what they learned here. (071301)

Another common belief expressed was that if The Field Museum does hire scientists, these scientists primarily perform the duties of exhibit developers—or are subject matter consultants in the exhibit development process. Some visitors indicated that this is a part of the scientists' responsibilities whereas other visitors said it is the only capacity in which scientists are involved with the museum.

[The Field Museum scientists do research] so they can put things on display and give more information to the public. (072003)

[Scientists are at The Field Museum] because they have to educate the world. A museum to me is an eye to the world—past, present, future....But it is an eye. And I don't think that someone illiterate can present that well. (082504)

Many other visitors stated that scientists come as independent consultants to authenticate specimens, such as mummies or to make sure that the information within the exhibits is accurate.

I don't know [whether the scientists work for the museum itself]. I would think that they work independently. (071902)

[The scientists] study the things that have been brought here, trying to decide if it's authentic or not, or where it should go. (071902)

[The Field Museum contacts university affiliated specialists] to have some kind of accuracy in [the] exhibits. (071704)

Some visitors seemed to think that the scientists involved with The Field Museum don't necessarily spend most of their time working on the premises. There was some indication that visitors were given clues throughout the museum which lead to this impression.

Maybe sometimes [the scientists] come in [to The Field Museum]...I was looking at [an exhibit]. They have...a zoology [department]...It looks like these people had gone to countries to do research. And I don't know if they were a part of The Field Museum or not....Maybe they're not actually working here, but they are working for The Field Museum...somewhere else. (072003)

Some visitors talked about scientists who live in the field full time. Some of them mentioned that they believed there was a network of Field Museum affiliates from around the world doing scientific field research. It appeared that in the minds of these visitors these scientists are **not** residents of Chicago who come in to work at their labs at the museum every day. One visitor seemed to have concluded this after seeing the map on the ground floor which shows the places in the world where Field Museum anthropologists are currently doing research.

Well, I saw some photographs of a map. And you seem to have people that are involved with what's presented here all over the world. There's an interesting map down where you go to find McDonald's. But it looks like you have research people involved with the Museum all over the world....I mean, [people] who are knowledgeable experts in various areas that are of interest to this Museum. (071801)

A certain group of visitors tended to list anthropologists and archaeologists separately from scientists when they mentioned the professions that comprise the staff of The Field Museum. These visitors seemed to think of anthropologists as a separate entity from scientists.

Teachers, scientists, anthropologists [work at The Field Museum]. (072501)

At the same time, when asked to name kinds of scientists that might work at The Field Museum, paleontologists, anthropologists and archaeologists were often the only technical names mentioned. We'll discuss this more in the section on terminology.

Another common conception was the belief that the museum does not hire scientists, but instead hires less educated and therefore lower salaried figures such as students, interns, care takers, “travelers,” and “animal specialists.” This belief, like that of university affiliation, seemed to be motivated by the assumption that The Field Museum can't afford to hire Ph.D.s. These visitors indicated that the responsibilities of these workers vary from assisting with collections to going on field expeditions.

I don't know [but] I would suspect the Museum cannot afford to have 200 PhD's working here, quite frankly. That would be my impression. (071801)

I don't know if [the museum would hire] even [people with] doctor[ates], but at least people with undergraduates in those things. (071702)

I'd say a lot [of the people that work in The Field Museum labs] are students of schools around there that volunteer their time....The admission in the museum is cheap...so I don't think they have the money to pay a lot to the people. (071803)

Other visitors did not say that *scientists* worked here, but rather talked of *historians*. They seemed to perceive the museum as focusing more on cultures and history than on science. Therefore, they tended to see the professional staff as being focused in those fields. One visitor said “people who know their history and geography” work at The Field Museum.

I think a lot of people who [work at The Field Museum] deal with world history. Archeolog[ists] and people who are doing history [work at the museum]. A lot of world travelers might [work there]. (072702)

Some visitors seemed to think the museum hires a mix of scientists and historians.

[People who work at The Field Museum are] probably like people that are history majors; like science [majors]—I don't know. I don't think they have...archaeologists but maybe. (072704)

Yes. I would imagine biologists, botanists, [and] insect doctors [work at The Field Museum]. I don't know what they're called. Probably [they] have ethnic studies, historians. All kinds of people, I would imagine. (080104)

A relatively small group of visitors accurately explained that scientists work at The Field Museum and conduct research. An even smaller number mentioned that these scientists do original research and publish articles in a variety of departments. A few visitors said that these scientists ask evolutionary questions.

[The Field Museum scientists are] trying to put together a puzzle...of how we came about to who we are now...like a dinosaur time line....They want to find the missing link between [this] species and [that] species of dinosaur. (072004)

Collection Size

In talking with visitors about the behind-the-scenes research at The Field Museum, we often discussed the collections. Two interesting trends emerged during our data collection. First, we found that most visitors tended to vastly underestimate the size of the collections, guessing regularly in the thousands; one million was an upper limit.

[I think The Field Museum contains] 3,000 [objects], I guess. I don't know. (072603)

[Guessing, I think the museum owns] probably around hundreds of thousands [of objects]. (072504)

[The Field Museum actually owns] like 1,000 and something [objects]. (072001)

It was unclear whether this underestimation was due to an actual misperception about the size of the collection. Perhaps when visitors talked of thousands and tens of thousands what they really meant was “huge numbers.” It was also unclear what they were referring to when they gave this number. Perhaps they were thinking of only the larger items such as the animals, dinosaurs, and mummies; perhaps they were including each of the individual insects and plants.

I would take a wild guess [that The Field Museum owns] about a million to a million-and-a-half [objects]. Maybe a million-and-a-quarter things. That's not counting the straight-pins. That's just counting the butterflies. (080101)

The second trend we found was that visitors tended to grossly overestimate the percentage of the collections on display. Most of this underestimation seemed to be rooted in visitors' perceptions of The Field Museum as being primarily focused on exhibits. If the reason to have stuff is to display it to the public, it would seem logical to exhibit as much as possible rather than hiding it behind-the-scenes.

I would think perhaps...half [of The Field Museum's collection] is on display. (071802)

I would think probably between fifty to sixty percent [of The Field Museum's holdings] are in storage. (072504)

Only one of the visitors with whom we spoke indicated they had an idea of the actual statistics—that The Field Museum owns approximately 20 million specimens and displays just over a tenth of one percent.

Visitor Collections

In talking with visitors about The Field Museum's collections, we often asked them about their own collections. It was interesting to note that the majority of visitors with whom we spoke, said they kept or had at one time kept a collection. These ranged from spoon and beer stein collections, to collections of glass shards, to C.D.s and books, to dishes with pictures of cats on them. One girl said she kept her father's fossil collection. Another visitor talked of a collection they had had for a long time.

I do have a collection. I have a number of Eskimo soapstone carvings. And I bought my very first one here at the Museum Store when I graduated from high school. I bought a little soapstone carving. It was signed and it cost me \$17.95....I added to that over time and now they've become too expensive. (081402)

Visitors indicated a range of understandings of how a collection is defined. For some visitors it was merely a group of objects that shared some similar characteristics.

[To me, a collection is] a group of things that are the same, pretty much. When you're a little kid sometimes you have a stamp collection. You collect a bunch of stamps. [It's] just different types of the same thing. (072704)

Other visitors had a much more specific and sophisticated definition.

I guess "collection" to me, suggests something fairly grandiose or grand. [A collection] is not just an object of beauty...it's an object in a setting. You know, the same way, really, any of those drawers [in storage] that I'd pull out—Let's say there was a passenger pigeon. It wouldn't just be numbered. It would also say what day it was collected on, where it was collected....Without that information, you've lost a lot....I think that's what makes it a collection, that tying it into a particular situation. When I was in Africa living, I collected examples of a tribal group's beaded wear. And that's a very good collection. That's a fine collection...a cultural collection of their work....So that's a true collection that I could cite the evidence for....I could give the native name for [each item] and tell what context it was worn or used in. (081402)

When you take a photograph, you're taking a slice of time. And I think that's exactly what a good museum collection is doing. It's taking a slice of the living world at one time and putting it down and letting other people come back and make comparisons to it. (081402)

We asked visitors to talk about the similarities and differences between their collections and The Field Museum's collections. They gave a variety of responses. While some visitors had some

very good insights into collections, very few went so far as to mention the research aspect. Many visitors compared them in terms of size, organization, and value.

I have some pottery, some old pottery, Byzantine pottery. Just a few odd pieces....It's not really a big collection. I think I have a few odds-and-ends....It's not like I look around...for more Byzantine...I just had some. I lived in Israel for a while...and you would just find it on the ground....The collections [at The Field Museum] are done by professionals. They tend to date them....[Mine] doesn't have the background [information]—that's more scientifically controlled....[The staff at The Field Museum] tend to know the background, and they tend to know where it came from and more history. (081403)

The Museum has things that are far more valuable—something that would relate to everyone, and [they have] things in the Museum that people of all ages and genders and nationalities would have an interest in. Whereas, my collection, you'd have to like dolls or frogs or spoons or Dutch things. (081804)

I'm quite sure they go a lot more further distance than I do to get some of the rocks that they have 'cause everywhere is different on earth....So, I guess [The Field Museum's collection] is a piece of everywhere. (082205)

A few visitors explained that the difference between their collection and The Field Museum's collection is that the museum's is for research and increasing public understanding.

[I] go to a beach, find a nice-looking rock, pick it up, match it to the other rocks in [my] collection, say "Okay. Well, it goes to this pile, that pile." [At The Field Museum] I think they sort things by age....I think [the collection is] more for knowledge...like to get people to learn and stuff. (081604)

I collect plastic horses....I think [my collection is similar to The Field Museum's collection in] that you have to have a certain interest in it to get them. [The Field Museum collection]...is not really just there for decoration, but you also learn from it....I think it's different [from my collection] because the horses [in my collection] are more there for show for me, because I like to look at them....But looking at the horses in my room you probably wouldn't learn that much. (081701)

A few visitors talked of the similarities between their collections and The Field Museum collection. One visitor who collected rocks said that the difference between her collection and The Field Museum's collection is that her's is simpler, but she said, "My collection is just as important to me as The Field Museum's collection."

Another visitor said The Field Museum's collection is more "evolved" than his collection but that they both did the same things with their collections which is to show things off, "to put them on display." (082305)

Real vs. Replica

Another interesting theme that emerged from our conversations with visitors was the distinction between real objects and replicas at The Field Museum. Although many visitors said that they thought that most of the things were real and that the museum told you when the object was a replica, most tended to overestimate the number of replicas.

[I think] maybe fifty percent [of The Field Museum's collections are real as opposed to replicas]. (080104)

I decided [the dinosaur] probably wasn't [real]. It looks like a lot of your exhibits here are...reproductions of things. [When I was looking at the exhibits] I was comparing it a lot to the Smithsonian, because I have been there quite a few times....Probably the main difference is [at the Smithsonian] they have more of the real artifacts. (071702)

Some of these visitors may have answered this way because they didn't want to appear easily duped or gullible. Many seemed to play it safe in their responses, saying “I hoped it was real, but I didn't think it was” or “I wanted it to be real.” It was not uncommon for a visitor to talk wistfully about the authenticity of objects—as if to say it would be nice but unrealistic to think that such good stuff could be real. Some visitors seemed suspicious that the objects in the museum displays were in fact replicas rather than the real objects.

In addition to the visitors who assumed that a large portion of the objects on display were replicas, many visitors explained that while looking at the exhibits they had been wondering whether or not things were real. Exhibit facilitators also talked of being frequently asked by visitors if things were real. Many other visitors explained that authenticity just wasn't something they'd thought about—they assumed things were real.

In fact, I didn't think about [whether the objects on display were real]. But I would think nearly all [are]. (071802)

I thought [the entire collection] was real, to be honest with you. (071902)

One visitor explained that many objects in collections weren't only reproductions—but forgeries. He implied that in making purchases it was inevitable that the museum would acquire some forgeries.

I'm sure a percent of [the collection] is...forged. It's hard to get [the real thing] a hundred percent [of the time]. I mean it's [not like] all the money you come in contact [with] in your life's real....There's always forged something or other. (072004)

Acquisition of Artifacts

Not surprisingly, conversations with visitors often touched on how the museum gets the objects on display. Although there was a wide variety of responses, four primary themes emerged.

Most respondents indicated that they believed the objects at The Field Museum were purchased, donated, or were loaned from other institutions.

[I think The Field Museum gets exhibits on loan]...along the lines of how Panda Bears travel [or] the Monet exhibit uptown. I'm sure there are exhibits that travel around, that you lease or rent. You know, you work on that basis. (080205)

In the case of purchasing objects many visitors mentioned a wide number of theories about who actually does the purchasing; their responses included the museum director, curators, and specially hired travelers.

[The Field Museum] probably [has] some [people] that they send out...[who] go from state to state, and make negotiations as far as what they would like to have in their museum...which would be a good attraction....They probably have to buy [things for the collection], I believe. I don't think they get too many things if they don't have to buy, because if that was the case...why would they charge us? (080302)

[The objects here at The Field Museum are] given by people, perhaps lent by people, and they borrow things. I'm sure they borrow—[they] have things that come from other museums that go on to different museums for a show. (080202)

Well, it seems to me they either contact people around the world to bring [artifacts] in, or they have their own representatives that go around the world searching for different displays. (071701)

It was not unusual for visitors to talk about scientists who go out on field expeditions as another method for acquiring museum collections. Sometimes visitors listed scientists in combination with the aforementioned methods, and sometimes independently. However, as we mentioned in the last section, visitors explained that these scientists were not necessarily full-time on-the-premises staff members of the museum. Visitors sometimes described them as free-lance archaeologists who sold their discoveries to the museum, or donated them in exchange for a plaque giving them recognition.

Sometimes, [scientists will] make a discovery and they'll approach the museum and say, well, we have this, and they'll approach them with something that they discovered. (071904)

Other visitors described them as people who lived out in the field, or as part of an international network of scientists. They often compared these scientists to nature photographers they saw on television.

[I would say that The Field Museum employs] people that would go tripping out to explore, like those that do things for the National Geographic Society, the Smithsonian, all of the people that go out to research and bring it back to the museum. (080202)

Still other visitors felt the people who filled this role for the museum were mostly students.

I think they hire students, the way I see it now...[The] more students that are involved, want to be involved in that field, whether it be archeology [or] paleontolog[y]. (082203)

One visitor described a resource shared by many museums.

Well, I'm assuming [The Field Museum] had some of [the dinosaur bones] probably that they, over the years, collected....I'm assuming they've got like a bone bank somewhere...so everybody—you know, someone needs this one, [someone] needs that one. But eventually, they have to send somebody out to look for them. (080206)

Many visitors indicated that they believed that the majority of The Field Museum collections are very old and were collected a long time ago. Many visitors said that the museum no longer collects things. They mentioned the difficulty in obtaining permission from governments to take things out of other countries these days. Many visitors stated that The Field Museum accumulated its collections in a time when people were not sensitive about these concerns. They stated that in the past The Field Museum took things without obtaining permission, often grave robbing, stealing from other cultures, and collecting in a not altogether ethical manner.

I don't know how they began to put the collection together. Maybe it was things from other exhibits and other private collections....And maybe how they obtained them wasn't completely ethical...'cause there's an awful lot of Native American things. And I don't know if they asked if they could take that totem pole. (080102)

We're from Europe. And as you know, in Europe...it's a very sensitive issue as to where things originate from because it's said that everything from the Middle East, for example, is stolen. So, all your exhibition of the Middle East must be stolen because it couldn't have been purchased because the owners were not there to give [permission]. (073103)

Probably [artifacts were] stolen... and then just eventually just fell into the museum's hands. But it probably ran around for many, many years smuggling

and that kind of stuff. I don't think they got any of it legitimately, for the most part. (071803)

Well, I think [The Field Museum collections come from people who]...just took [artifacts] quite frankly.. The American, colonialists, whatever you want to call them [took things]. Certainly, the Indians didn't bring them to the Museum. (071801)

Many visitors seemed to be particularly attuned to these issues, and therefore, seemed to believe we live in a time in which The Field Museum has a harder time expanding its holdings.

They may, as a museum, have archaeology digs in other countries and stuff. But I would assume that a lot of this stuff came many years ago when it wasn't as stringent, because I know a lot of countries are refusing to allow a lot of their stuff to leave the country. (071803)

I don't know if... the laws of the places where they go, the various countries will allow them to take things away anymore. I imagine it's probably quite controversial now, but in the past, I imagine, they just found things and brought them back. These days, it probably doesn't work that way. (080104)

In recent years there is an uproar with all the governments and today the stuff couldn't be obtained. Fifty years ago it was a very different environment for scientists who got this stuff." (M082202)

Finally, a smaller number of visitors said that the people who go on collecting expeditions for the museum are wealthy individuals who have time to travel or go on safari. One couple mentioned reading about Teddy Roosevelt and the RoughRiders in the museum and used them as an example.

They are mostly rich kids. They don't have to go out and make a living, so they study stuff at the university. They don't have to make a living, so they go over to some place and study stuff and good comes from it...Folks like us who have worked every minute of their life trying to put bread on the table, they don't have time to do this. But the rich, the aristocracy, with as much as they have, [they go]. (071301)

We can see that visitors possessed as many beliefs about how the museum acquires specimens as they did about who the figures are that conduct research on these items. However, it is clear that the majority of visitors we spoke with did not understand that the scientists at The Field Museum go on field expeditions and return to labs at the museum to study what they have found.

Artifacts in Storage

Another interesting theme that emerged during conversations with visitors was their perceptions of the objects the museum has in storage. The majority of visitors acknowledged that a portion of the museum's holdings are not on display, but their reasons for why the museum would have things in storage were varied.

The most common response from visitors was that due to limitations in space, the museum keeps a certain percentage of objects in storage. Visitors said that the objects in storage are kept on a rotation which keeps new items coming onto the floor and local visitors coming back.

It seems like all museums do that. They...rotate stuff so that people will keep coming back. (071702)

Other common reasons visitors gave for an object to be kept in storage were preservation and maintenance.

[Things would be locked up because] they might need to go through retreating processes, because, like I noticed lately, some of the best, they don't want you to touch them...because it puts a shine on the bronze....Because of that, I think sometimes they have to probably retreat those maybe every so often. (080302)

Some visitors also explained that an object might not be on display because it is waiting for an exhibit to be finished or even formulated. They also mentioned that old exhibits might be kept in storage, as well as things needing to be updated.

[Something would be in storage because] they might be updating it or they might be exhibiting something else that day. (072603)

Some visitors felt that the objects kept in storage are the least interesting or popular of the museum's holdings. Some visitors suggested that they might be duplicates—or duplicates given as gifts which the museum will use in trades with other institutions.

I imagine they have...drawers full of specimens of various types that maybe aren't quite as good a specimen as the one they have on exhibit, for example. Or they just...accumulate lots of things. Maybe there's donations...duplicates of things they already have. And rather than just turn it down, they just take it and maybe they can trade it with another museum to get something they need or whatever. (073102)

Other visitors suggested that the things in storage are the most valuable artifacts. The reasons why a valuable object would be kept in storage rather than on display included speculations that they might have been acquired illegally, that they are being kept as models from which to build replicas, and a belief that they are being researched.

[Storage is] where the good stuff is. Things that are too fragile for the environment [are kept in storage because they don't want] people breathing on them and like hot air and all that kind of thing. Very, very valuable books. I have a feeling that [they are kept there]—and bones. (072601)

Good question. Maybe [storage exists because] they've got doubles. I don't know. [The Field Museum has] more than one of some things. Or they don't want people to see it 'cause it's worth too much money. Or maybe they put a replica on display and they've got the real thing. [They have the real thing because] they need [it] to make the replica maybe. (072704)

A few visitors explained that everything the museum owns is on display. A small group of these visitors indicated that they felt it would be wrong for the museum to own an object and not keep it on view for the public.

Few visitors talked about research on the collections as being a primary reason they were stored behind-the-scenes. The most common form of research mentioned by visitors was on the subject of age. They said that in storage, researchers could date the age of bones. They also mentioned that this was where research was done on objects in order to write exhibit labels.

[They have things in storage] just to maybe conserve them; to maintain them; to catalogue them; to study them; do research. [You] can't just have things out in the case[s]. (080102)

Only a few visitors indicated that research constitutes the greater purpose of collections.

Organization of Storage

Many visitors also talked about how they believed the objects in storage were organized. The majority of visitors felt that things were organized in some way.

Yes. [I think storage is organized in a particular way.] They should, at least. I hope they are. They're scientists. Scientists should be organized. (071903)

Visitors tended to give one of several speculations about the method of this organization.

One of the most common answers to this question was that stuff in storage is organized “by what it is”—that is objects in storage are categorized according to their identity. In this scheme elephants are with elephants, and all the bugs are together. Only a small number of visitors specifically mentioned genus and species as the way things are organized.

The other common response was that objects in storage are categorized by region and time period of origin. From the examples given by visitors, this idea seemed to be derived from the organization of exhibits, i.e. Africa, Ancient Egypt, and The Pacific.

A few visitors explained that things in storage are grouped alphabetically and a few mentioned that artifacts had serial numbers and would be catalogued in this way.

Terminology

As described above, during our conversations with visitors, we asked them to participate in a card sorting activity as a way to get a better understanding of how they were thinking about what goes on behind-the-scenes at The Field Museum. We stressed that there was no right or wrong way to sort the cards.

Each visitor did the card sort differently. Some visitors placed the cards in piles, some in columns, and some made flow charts. One put the cards in alphabetical order. We encouraged them to put aside the words they didn't know or want to guess about.

As we engaged visitors in this activity, we began to notice certain common patterns of responses with and misunderstandings of certain words.

Though we guessed most visitors wouldn't be familiar with the branch of science known as "systematics," we placed it in the pile to let more sophisticated visitors show us what they knew. Almost universally, visitors did not understand what was meant by this term. Generally, they used it to mean "a system" or "systematically." Otherwise, they placed it to the side.

I think [systematics] is just like a system for solving a problem. (072004)

The word "taxonomy" was another commonly misunderstood word. We were surprised that most of the visitors with whom we spoke confused the word "taxonomy" with "taxidermy."

*Those are just different forms of sciences: botany, zoology, taxonomy.
[Taxonomy] is the stuffing. [Zoology] is animals, I think. And [botany] is plants.
(072002)*

Taxonomy, isn't that like—Does that have anything to do with taxidermists? (072004)

Some visitors were familiar with the term, and a few who told us they were teachers, referred to "Bloom's Taxonomy."

Another word that visitors sometimes used but often had a hard time defining was the word "curator."

I went to the Metropolitan Museum of Art. Now the director there was a relative. And so he took me around and he showed me all the behind-the-scenes. And I'm trying to think of the terms of what all these people were doing there. And "curator"—I'm just trying to define it. I don't want to use the word out of context....I'm going to have to look up the word "curator" when I go home. (071704)

When they did define this word they rarely used it in the way that it is used by The Field Museum.

[I think a] curator is someone who goes out and buys art treasures. (082604)

When we asked visitors to list examples of scientific specialists that might be employed by The Field Museum they often listed anthropologists, archaeologists, and paleontologists—but seemed to have a harder time listing other specialists. Sometimes they referred to “plant people” or “insect doctors” or “people who study animals,” but overall, they appeared to be less familiar with the nomenclature for these specialties. In the card sort, they seemed to be less confident grouping the cards for “botanist” and “zoologist” than “anthropologist” and paleontologist.”

We said anthropology, paleontology. I can't think of any [other specialists] off-hand. (071701)

I assume either working here or associated with it you would have a paleontologist, maybe some social anthropologists. I don't know what you call people who study minerals. But that's off the top of my head. (082503)

One surprising trend was how many kids used the terms “archaeologist” and “paleontologist.” Perhaps films such as *Jurassic Park* and *Indiana Jones* have put these words into the mainstream. When discussing who might work behind-the-scenes, one visitor talked about maids, cleaning staff, business staff, and curators who work here. His young son whispered his contribution, which was “Paleontologists...[who] do research on everything”. However, not everyone was familiar with this specialty.

Paleontology. That's people...It's the study of like culture or heads. I think of a head with paleontology and bones and things like that. (071301)

Perceptions of Science

As we talked to visitors, we tried to gauge a sense of their general level of interest in science. Visitors talked about their science hobbies—ranging from collecting rocks to star gazing and some shared anecdotes about dissecting frogs and building electronic switches for the science fair. They also told us what they thought of when they heard the word science. Some visitors gave a definition and others gave a list of nouns such as “lab coats,” “petri dishes,” and “physics.”

[Science makes me think of] technology, for the most part. And these days, I guess it's advance and change. (081402)

[The word “science” makes me] think [of] animals. Researching animals. Like geography, like landscapes. Stuff like that. (081701)

So, science—I guess what I think of it as [is] some sort of organized way of seeing the world or studying the world and measuring the world, sort of examining it and sort of getting explanations for the way the world works. (081403)

We also asked visitors to give us their own definition of natural history. Some visitors struggled, while others gave definitions which included evolution, plants, animals, and geology.

[I understand natural history as] the operation of nature as it interfaces with plants, animals—including humans—and the earth in general...Calamities such as volcanoes or earthquakes would also be part of what I envision as natural history. (081402)

Many visitors did not have a lot to say about science, while others spoke quite earnestly about the value of science in their own lives and to society.

[I'm not interested in science now] but...I am going into high school. I'm going to be a freshman. And like I want to really get into science. Because when I get older I want to be a pediatric cardiologist. (080103)

When I was younger, I liked microscopes, stars, you know. I like planetariums... [I enjoy science] more as I get older. I consider [it more a] part of.. my life now that I have children....And also you relate it more to where you came from, where you're going and when you die, how is it gonna affect everything. So, you'd like to know more about your history of where you came from. (082203)

Oh, I think [science is] great. I think it's like a humongous amount of time and money, but it's worth it to humanity because that is how we progress and change life...overall....Changes are made through the scientific studies in all areas of things. (082504)

And you have to keep researching. If you lose it, if you don't continue to research, then we become stagnant with what we have. And things develop. Cures for viruses and other things aren't developed. And you might as well just fold up the tent. (082203)

I think [science] is very important. I bring my kids here because I want them to consider science as part of their lives, not just a subject that they take in school. I want them to know that it's all around them all the time. (082503)

Perceptions of Scientists

As well as talking with visitors about scientists at The Field Museum, we talked with them about their perceptions of scientists in general. Many visitors responded with answers about how scientists look. These responses varied from “nerdy,” “they wear glasses,” to “like Indiana

Jones.” The following statement is just one example of the type of stereotypical response we got from many visitors.

Scientists [are]....people dressed in white coats. (082501)

Because there has been significant research conducted into the stereotypical views people hold of scientists, we felt it was beyond the scope of this research report to explore this issue in much depth. It was clear from our data that visitors were aware of the stereotypical image of the scientist. In fact, many respondents indicated they knew the stereotypes but they knew enough to know the stereotypes aren't true, and that scientists look no different from the rest of us. Of course we don't know to what degree visitors told us this because they knew it was in some way the “right” answer.

[Scientists are] like everybody else. (082503)

What [scientists] might be like or look like? I think they would have very good dispositions. I would think they'd be questioning, probing people. I think they would be very active. But as far as what they look like, I think that if you line them all up, you wouldn't pick a scientist. They look like everybody. (081804)

I think an archaeologist is just like an every day person, except that is their career. That is what they chose to do in life. And they do a lot of traveling in order to find things in different places. (082501)

The majority of visitors explained that they believed that scientists experienced “a spark” when they were young and decided to be scientists at an early age. Some mentioned that college was probably a pivotal point in deciding to become a scientist; some mentioned mentors and teachers as being instrumental in motivating young scientists.

I think [scientists decide to become scientists at different times.] I think kids who visit places like this can start the spark. I think there's kids who pick up this stuff. And then when they go to school, I think they tend to be interested in it. And I think probably if their math is okay...they probably have that sort of inclination....Mentors are probably important in terms of getting the right teacher. I guess it probably starts early on....College is probably a real important turning point, whether they find the right faculty and decide whether to go that academic track. (081403)

Nearly all visitors described scientists as people who are motivated to do research because of their strong, active sense of curiosity.

Maybe just [scientists'] inner curiosity [motivates them]—you know, “This really turns me on. This is where I feel gifted, this is where I feel useful, this is where I have special abilities that somebody else doesn't have.” Or the patience; you know, some of them would require a great deal of patience, research skills. (072502)

[People become scientists because] they are curious, number one. I think it's out of curiosity. (082306)

I think they're good listeners. And I think that they realize the principle that God gave you two ears and one mouth, so you listen twice as much as you speak. And that's how they're able to acquire the mass knowledge. That and their curiosity. (081804)

Many visitors seemed to feel that scientists are very devoted people who are dedicated to their careers and love what they do.

[Scientists here] love what they do. They want to be a part of a museum like this. (071704)

[Scientists do research] because it's exciting. It's creative. You could ask the same questions of why do people do art, and you'd get exactly the same answers. There's an inherent excitement in—in the case of art, expressing something, the way you see it. And in the case of science, getting insight into the way you think the world works. I mean, they're both creative and exciting processes. And I think people do science because they get that enjoyment out of it. It's not the publications. Actually, if you ask even a great scientist how many of his publications he was really happy with, you're usually talking about a much smaller number than his total production. And it may be trivial reasons, you know, why he was really happy with that particular paper. It may have accomplished something that he really felt was important to the field. So, yeah, I think they do it for that thrill. (081402)

Scientists are always learning. We are always learning as people, as human beings. So, as far as their studying, you know, like the scientist says, "For every answer there's three or four more questions." So, it's like a ongoing process. I guess that's what makes it so exciting. (082205)

Some respondents described scientists as being experts, or very knowledgeable.

[I never wanted to be a scientist because] I think you need a bigger brain for that. (082504)

[People] like anthropologists...aren't just like every Tom, Dick, and Harrys. (071904)

I think [scientists] are very observant people, with a huge memory. And people who are basically enclosed in the world of the unknown, trying to learn more about it. (082504)

One visitor differentiated between different types of scientists.

It depends on what their field of science is. If they are into animals and dinosaurs, I think it would be pretty interesting and fun, I think. I'd love to go dig up bones and stuff like that. If you are talking like mathematical scientists and bioscientists, I don't want to deal with them because to me they are bookworms and snobs. (082306)

One visitor described a different way of thinking about scientists.

In some ways, everyone's a little bit of a scientist. Otherwise, new recipes wouldn't be created in people's kitchens at home. New games wouldn't be invented by kids in the schoolyard. In each person's way, they are a scientist. They discover things on their own. (081804)

Scientists' Stories

In our conversations with the scientists on staff, we enjoyed listening to the many fascinating stories they shared with us. These stories covered a wide range of topics including how they got interested in science, how they got a particularly large and disgusting object into the museum, how they went on an interesting expedition, how they are currently working with different foreign countries, or studying living cultures right here in the United States. These stories were right in line with many of the notions of scientists some visitors shared; others we thought might be surprising and particularly interesting to visitors. We included a sampling of some of these in Appendix D. We also included some of their descriptions of how they had successfully interacted with visitors.

Dead Stuff

Another interesting theme that emerged during our conversations with visitors was visitors' feelings towards seeing dead, stuffed animal specimens. We began to ask visitors several questions aimed at ascertaining how they felt in the mammals hall, why they felt these specimens were at the museum, and whether they thought it was “OK” for these specimens to be a part of the museum's collections.

The majority of visitors expressed that they were not uncomfortable with The Field Museum having these collections, as long as the museum was not continuing to hunt animals. Most visitors understood that these specimens were collected many years ago—before these animals were endangered. Other visitors expressed curiosity about The Field Museum's current collecting practices.

Well, my oldest who is fourteen kept saying, "Did they kill all these animals just to put them in a museum?" Because she is used to zoos, and she is used to...the San Diego Wildlife Refuge that we went to a few years ago....We saw the animals in natural habitats alive. And she is used to that. So it made her really upset that they would actually kill animals to put them in a museum. But I—hopefully

truthfully—explained to her that they were killed...many years ago, that that is not a practice that people use much anymore. But that was...popular fifty or sixty or however many years ago that those displays were started. (072502)

I've seen a family of baby lion cubs. I was wondering, how did they acquire them? Were they sick when they got them? Were they just dead when they found them? (082306)

A smaller portion of visitors explained how uncomfortable they felt seeing so many dead animals. One visitor said that seeing the animals “makes me feel bad—the animals look healthy and people kill them for selfish reasons.” One exhibit facilitator talked about this phenomenon in detail.

The other question I get...in the Africa exhibit is—at least once a month, and sometimes more often—I'll get someone who comes in...who stands there and says, “Were those animals real, or are they plastic?” And I say, “Real,” and the tears begin. They say, “You killed them.” I say, “No, no. [They were killed] a long time ago...and some of them are a hundred years old. And when [this was] first done we did not have cameras. We did not have real cameras. We did not have television, we didn't have movies, people didn't really know what the whole animal looked like. And we don't do that anymore....And there was one time...a woman, an older woman, who came in and asked. And I explained we don't do these things anymore. It's a different time, a different era, a whole different attitude towards these things. And she went on and on. There's this woman sobbing on the bench out there....Well, I can understand because my niece...was here two years ago. She ran out of the museum crying and saying, “It's a dead zoo. It's a dead zoo.” (F081501)

Most visitors with whom we spoke listed reasons why they thought the animals were at the museum. These included giving visitors the opportunity to see them up close, and a feeling that sometimes it is necessary to kill one animal to be able to do the research in order to save the species.

The irony is that you sort of like to preserve these animals. Yet, these animals have been killed to do that. So, that's always a funny kind of thing. (081403)

Some visitors seemed to feel quite positive about having the animals on display.

[The elephants] have an ageless, timeless quality about them. They are very large, and they take my breath away. And they fill my children with awe. And me. And I think we are lucky to be able to see them....When you walk into the entryway and you see them, you forget Michigan Avenue. You move into another time and space. (082503)

[Looking at the elephants] shows you how powerful...how things are not what they seem to be, how different they can be. You know, and it's not what you see every

day when you walk out your door. The rest of the world— it brings you down to earth. Makes you very...humble. Yes. That's the word I was looking for. (082203)

Some visitors said they understood why the animals are here, but that it still saddened them to see them stuffed, rather than in the wild. While the majority of visitors did not seem upset by the animal halls, we noted that this was an extremely sensitive issue for some visitors.

There was also indication that study mounts were more upsetting to some visitors than more realistic mounts. This supports evaluation research done at Michigan State University Museum recently that suggested that visitors were more accepting of realistic portrayals of animals (Morrissey & Carmichael, 1995). In this exhibit—designed to show visitors how the museum uses its collections for research—visitors appeared particularly disturbed by study skins that were displayed on hangers replicating a behind-the-scenes collection. One young visitor we talked with at The Field Museum appeared particularly upset by the white cotton in the eye sockets of a study mount, repeatedly asking why it was like that and comparing it with other mounts that had more realistic glass eyes.

The Title: The Exploration Zone

We asked some visitors to talk with us about the working title for this exhibit and to speculate about what they might expect to see in such an exhibit. The most common response from visitors was an “interactive exhibit [with] hands-on stuff that the kids especially like.” (081805) The majority of visitors said they thought an exhibit with that name would focus on space exploration, famous land explorers, or a very specific geographic area. A significant number of visitors commented on how vague a title it was.

I don't know. That would be a confusing [title], I think. It's not very specific. All we could do is draw our own conclusions, I guess. (082302)

[It's] generic. Exploration of what? (082203)

[I think it means] explorers, like Columbus and Cook. (081803)

I...think it would be about a specific area, like exploring South America, [or] a part of South America. Something of that nature. (082305)

One visitor said the name made him angry because it is too vague.

It's another sucker for kids because it doesn't explain what it is. (081801)

Visitor Perceptions of The Field Museum

Though we did not deliberately set out to talk with visitors about their overall impressions of the Field Museum, we managed to collect a good deal of this information incidentally. Visitors tended to be very happy to share their perceptions and memories of the Field Museum with us and to volunteer their opinions. Because there was so much of this information and it seemed to fall into obvious categories, we thought we'd include it as a bonus in our findings.

We found that for many visitors, coming to The Field Museum seemed to evoke nostalgic feelings, often stemming from childhood memories of coming to the museum. Some visitors had very specific memories of the museum and warm feelings about museums in general.

There's a cougar all the way in the back where they describe dogs and cats. And there's a little plaque that says "This cougar can jump forty feet, or twelve meters, to scale a cliff wall." And that's the one thing I think of every time [I come to The Field Museum] because what I did was I told this to my dad—and my dad's a mathematician—and he goes, "Okay, let's find out how fast he accelerated to be able to do that." And every time I come back here I have to check on how far it was and what kind of animal it was...So that's one of the things I always come back and remember. (072703)

I think [The Field] Museum plays a big part of science, because actually it may evoke thought in a child. And if we can't evoke a thought, then we can't learn. And if we can't learn, we can't advance. I think advancement is important. And you need to evoke thought to start all that. (082302)

And so...as a child...my father would do all sorts of experiments. We'd build crystals. We'd create crystals. I was a Girl Scout leader for seven years and was able to use the things that my father showed us or things that we garnished from museums...in this area. (081804)

Well, [The Field Museum] is really an encyclopedia....It covers the whole range of science. I think the nice thing about The Field Museum—I've got young kids—is that if I wanted to pick a certain area like geology or paleontology...it seems like the whole range of science is...here. And actually, I grew up here and moved away. And The Field Museum has so much more to offer than Indianapolis where I live now. (081403)

Many visitors commented on how much the museum has changed—most thought for the better. A good number of visitors commented on how much they enjoyed the museum's move towards "hands-on" exhibits.

There were so many things [that] were hands-on. I really like a lot of that. [It was good for] my granddaughter and myself. It gave me an opportunity to sit

down and play. And those are the things that are really nice, and I think it helps kids enjoy the programs more when they can do stuff. Listening to the bats machine—you can hear...the bat. It's just neat. I loved it. We did everything in here. (071704)

The hands-on—I love what you have done to it recently. It's great. You have actually made it into a place that is more pleasant. I was just telling the children on the way here that it was just...a bunch of dead animals, I'm sorry to say. But when I got here, it's a lot of hands-on. There [are] people interacting with the children, with the people. And you feel like a part of it instead of...[like you're] running through like a big, dreary [place]. (082302)

Many said they used to enjoy going to the Museum of Science and Industry more but now they have become fans of The Field Museum.

This museum gets better and better. It used to be...we hated to come to this one. It was always going to the Museum of Science and Industry because there was so much more interaction. Now this is getting a good reputation. I mean it was [my granddaughter's] choice to come. (071704)

Some visitors were disappointed in these changes to The Field Museum, while others thought the museum needed to change more in certain areas.

I think [The Field Museum] put a lot of work into being accessible for younger kinds of people. The cartoons all over the place. For me it's almost too much actually. (072703)

I went [to the Africa exhibit] to show my students—I teach African history. I'm thinking about bringing my students back to it 'cause I like it. [There is also] my Race In Society class. I brought them here to find the European section...'cause that's like an obvious racist statement....Where's the pioneers and how ridiculous they looked? You have the...American Indian woman but no Salem witch hunts....You have bags of religious artifacts from American Indians but no Seder plates. (080101)

Interestingly, when we asked visitors if they considered the focus of The Field Museum to be science or if they considered The Field Museum to be a “sciencey” place, a large portion of visitors indicated they didn't consider the focus of the museum to be on science, but rather history. They seemed to relate most to the cultural, historical, and anthropological aspects of the museum.

[I wouldn't really think of The Field Museum as being a sciencey place.] Not really. It's more like different cultures. Like culture. (080103)

[When I came to The Field Museum I was expecting to see] different artifacts about ancient man, about pre-history. Things like that. (071701)

I would say [The Field Museum is] more [about] history than science. (082306)

While some visitors professed to liking science, many visitors said that they weren't as interested in science, but they liked to come here to see "old things" and artifacts of ancient peoples.

[I was looking forward to seeing] old things [when I came here today]. I love old things...from Australia and New Guinea. (071901)

In comparing The Field Museum to the Museum of Science and Industry, most if not all visitors considered the museums to have the same goals—to educate the public through exhibits—but to have different concentrations. As we've discussed, the majority of visitors thought of The Field Museum as focusing on history and the past, and the Museum of Science and Industry as focusing on the present and future. Generally, visitors appeared unaware that The Field Museum has a scientific research agenda, whereas the Museum of Science and Industry does not. In fact, many if not most visitors thought of the Museum of Science and Industry as being the more "sciencey" of the two museums.

[The Field Museum] is definitely teaching you about different histories that occurred before, as well as what's going on now. And depending on some exhibits, what can happen in the future....I think the [Museum of Science and Industry] is more to the future....They've got the past too in the Science and Industry, but they lean towards letting you know what can happen in the future. Here, it seems like it's more in the past and present. (080302)

[The Museum of Science and Industry] is more like post-Industrial Revolution....It's like charting our industry. [The Field Museum] is charting...the world's development. (072004)

[The Field Museum] doesn't have all the bells and whistles that Science and Industry does. It's calmer, more laid-back. [It's like] "This is where you come from. And this is where you've been. And learn from it and improve from it." (081804)

[I do think of The Field Museum as being sciencey.] It's a lot of nature. Personally for me, I like history. I think it's a little more historical, but that is science also, you know? There's...many fields of science. It's not so much like the Science and Industry Museum, which we enjoy too. But this is more of a historical place...and natural sciences. (080206)

I'd have to say I consider the Science and Industry one to be more of a sciencey place in the science of technology. I consider The Field Museum to be a natural history place....I see there as being a big difference. I don't necessarily see one

as being more or less important. As technology makes advances, we're still set in a natural setting. And unless kids that spend time plugging into a computer can appreciate ecological crises, they're gonna be in trouble. I don't see one as being better or worse than the other. I see both as being necessary education[al] experiences. (081402)

Behind-the-Scenes Questions

In talking with visitors, we asked them what question they would ask if they could ask and have answered only one question regarding what goes on behind-the-scenes at The Field Museum. Of the questions we received (see Appendix E for a complete list), most fell into one of seven discrete categories, with only three questions falling into a miscellaneous section.

Most visitor questions had to do with the acquisitions of artifacts, but this may be because much of the interview was focused on this subject.

Where do you get some of the stuff and how? I didn't think Indiana Jones still existed. (082605)

How do they pick out what they want to find? (082206)

How do you all come up with all that? Or how did you all ever get the idea that these things was, ya know, still around? Or how did you all ever discover 'em? (073101)

A large number of questions focused on exhibits.

How do they figure out what the next feature is going to be? Do they give out surveys asking people what they are interested in? (082303)

What is the average time it takes to design and display an exhibit? (081805)

Many visitors asked questions about specimen handling and preparation—with an emphasis on dinosaur bone questions.

How do they prepare the dinosaur bones for display? (082102)

How long does it take for you to put a dinosaur together? A big dinosaur? (80105)

And some visitors asked about the storage. Again, there may have been increased interest in this topic because of the interview questions we asked.

I'd like to see the storage. I'd like to see a storage area really happening. (080102)

What do they do with the stuff that's not on display? Who decides if the stuff goes on display? (082606)

As mentioned previously, there were only two content-related questions.

What's the latest discovery on the origins of Man? (082304)

What is the meaning of life? Scientists here have an opinion on it. (082204)

Interestingly a number of visitors asked questions about cleaning.

How do they keep everything so clean? (081804)

Who dusts the exhibits? (082506)

We were particularly interested in the questions visitors would ask about what it's like to be a scientist at The Field Museum. While most visitors did not ask questions about this—in spite of our lengthy conversations with them about scientists—a few did.

Are people working here for the money, or do they have an interest in what they do? (082101)

I'd certainly be interested in one question. How many people it takes to run the show. (073103)

What is it like to work at The Field Museum, to know all the stuff, not just the paragraph on the exhibit? (081803)

Two visitors were quite thoughtful in their queries about what it's like to be a scientist at The Field Museum.

How do scientists have the patience and effort to do this work? [I am especially curious about the questions that scientists ask themselves when they're doing research]. (081701)

I would be real interested in how [scientists] balance their research in being an institution like this, as opposed to a straight research institution. (080101)

DISCUSSION AND CONCLUSIONS

In the preceding sections we have attempted to present an accurate overview of the many and varied ways in which visitors think about what goes on behind-the-scenes at The Field Museum. It seems clear to us that most of the visitors we spoke with think of the museum as primarily a place that exhibits “cool stuff” and as a place where they can experience new things. It doesn’t appear that in general most visitors are that curious about what goes on behind-the-scenes. Not surprisingly, those who were, tended to be more interested in the exhibitry and specimen preparation aspects rather than the scientific research. There were many indications that many visitors are looking at museums—including The Field Museum—as institutions whose main purpose is to exhibit things for the public to see and interact with during their leisure time rather than as research facilities.

It was interesting to note that almost without exception the images that visitors conjured up about what goes on behind-the-scenes were often not inaccurate. Almost without exception, explanations visitors offered about what might go on behind-the-scenes were grounded in some amount of truth. There **is** a lot of maintenance and cleaning of the exhibits; scientists **do** consult on exhibit development teams; there **is** a significant amount of time spent designing and fabricating exhibits. Even in terms of the scientific research that is carried out: visiting scientists **do** come to study the collections; the museum **does** work with scientists from universities; there **are** people out in the field collecting specimens. It can even be argued that the idea of a bone bank as described by one visitor is not that far off.

There were two notions however, that appeared more difficult for visitors to grasp: 1) that The Field Museum employs a number of full-time research scientists that work here in Chicago at the museum, and 2) that The Field Museum is different from many other museums because of the scope and amount of scientific research it conducts, i.e. it has a primary research function. Before we can expect visitors to understand the significance of the scientific research that The Field Museum conducts, we must communicate these more basic ideas first. And this will be no easy task because these ideas contradict what visitors think they already know.

The real challenge for the exhibit development team will be to present these counter-intuitive ideas to the “visitor-on-the-go” with a family tugging at their sleeves begging to see the dinosaurs and the mummies, without reinforcing the increasingly popular notion that the museum is full of simulated experiences and replicas.

Increasingly, museums are being called upon to create environments that focus not on the imparting of knowledge or even a message, but on facilitating socially-mediated-learning experiences. Traditionally, the role and function of an exhibit has been to communicate a particular message, or to teach a certain concept. With socially-mediated-learning, the role of the exhibit becomes to help visitors create an appropriate meaning out of their experience. This notion is related to long-standing constructivist theory, that people don’t learn by absorbing facts and knowledge, but by creating meaning out of their experiences. The question then becomes: How can the exhibit be designed so that visitors create appropriate meaning?

One of the toughest parts of this job is that some visitors have already formulated many ideas about what might go on behind-the-scenes, most of them somewhat romantic in nature. As we conducted this research it was very clear that the visitors' conceptualizations and ways of thinking about and understanding what goes on behind-the-scenes at The Field Museum are a world away from the exhibit developers, and the researchers on staff. Following are a few recommendations based on the research we have conducted so far.

RECOMMENDATIONS

Emphasize that The Field Museum employs many full-time researchers who work at the museum

The idea that the museum might work with scientists to do research on its collections was not a foreign idea for many visitors. However, the idea that the museum employs many full-time scientists specifically to do research and that they work primarily at the museum, was a harder concept for many to swallow. This message should be subtly and explicitly repeated throughout the exhibit. Although collaborations with researchers from other institutions are important to mention, many visitors already seem to understand this. Furthermore, this understanding may cause them to misinterpret references to Field Museum scientists working on the collections.

Start with what the visitor is interested in

There are a lot of interesting objects and many fascinating stories about the research and scientists here at The Field Museum. One of the principles from educational theory for stimulating curiosity is to “surprise and intrigue.” We know that in general, visitors to The Field Museum are not thinking much about the research, but if we surprise and intrigue them with things they didn’t know about, or things they didn’t expect to see, we are much more apt to get their attention. This then becomes the hook, the door into a discussion about the research.

In order to do this, we need to find out what is interesting to them. What questions do they have about what goes on behind-the-scenes? There is some indication that they are more interested in the preparation of specimens than the research science. If this is the case, we might show visitors the beetle room, or how dinosaur fossils are picked from rock. The next round of evaluation research should focus on the questions visitors have when confronted with objects from the collections. The exhibit should then answer these questions.

Continue conducting front-end evaluation

This round of evaluation illuminated many interesting aspects of visitors understandings of what goes on behind-the-scenes at The Field Museum. However, it also raises many additional questions. What do visitors want and need to know about the scientific research that is conducted at The Field Museum? What is needed so visitors construct appropriate meanings from their experience in the exhibition? What questions do visitors have about specific artifacts? What are the most exciting hooks for visitors? Which of the scientists’ stories are more interesting for visitors? Further interviews with visitors need to be conducted to answer these questions.

Explain where the collections come from, particularly the large animals

Many visitors were curious and concerned about where the dead animals come from, often appearing to want reassurances that the museum did not go out and shoot them, or at least that they no longer do. An explanation of where the specimens came from can help alleviate some anxieties, and also help people understand the current collecting policy of the museum. This

might also provide a segue into a discussion of the research that is on-going. It also allows for a discussion to address the real vs. replica confusion that some visitors experienced.

Design for significant social interaction

More and more as we design exhibits exhibit developers are taking into account the social nature of the museum visit. This exhibit in particular can provide many opportunities for adults to interact with their children and provide important teaching/learning guidance. Because this exhibit is not about something that visitors have expressed much natural curiosity about, the need for inter-generational communication (teaching/learning behavior, directing attention, explaining) is even greater. By designing the exhibit for the family group as the primary audience, the needs of virtually all other visitors will also be addressed.

Emphasize the scientists-as-people approach

Another principle of designing intrinsically motivating exhibits, is that visitors need to be able to make a personal connection to what they are seeing. In our relatively brief conversations with the museum scientists, we discovered many fascinating stories. By highlighting these stories and the lives of the scientists, visitors will be more likely to make a personal connection with their research. Again, the focus is not on the research itself, but the passion in these scientist's lives.

Showcase the work of an anthropologist

Visitors appeared much more connected to The Field Museum in terms of its focus on people, culture, and history than as a science museum. Showcasing the work of an anthropologist can provide an important link to people's understandings of the research that is conducted.

Use simple and visitor-friendly terminology

Visitors have a remarkable capacity for misinterpreting some seemingly basic vocabulary. In this exhibit, it is important to use words that are not misinterpreted, and won't need explanation. Words such as *taxonomy* and *systematics* are so close to other more familiar words, they are often misinterpreted by the lay public. Other words like *curator* tend to have specific art museum connotations that get in the way of visitors understanding them in the science museum context. Again, further research to find the best words to use is essential.

Focus on something other than the field expedition aspect of the scientific research

Most visitors seemed to have quite accurate although somewhat romantic notions of scientific collecting expeditions. While these are natural hooks for many visitors, they tend to reinforce the misconception that The Field Museum does not employ its own scientists nor conduct its own research. Field expeditions should be mentioned only as one small aspect in the larger context of what the life of a Field Museum scientist is like.

BIBLIOGRAPHY

- Bielick, S., Pekarik, A.J., Doering, Z.D. (1995). *Beyond the elephant: A report based on the 1994-95 National Museum of Natural History Visitor Survey*. Washington, D.C.: Smithsonian Institution.
- Harding, S. (Ed.). (1987). *Feminism and methodology*. Bloomington, IN: Indiana University Press.
- Lincoln, Y. S. & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.
- Morrissey, K. A. & Carmichael, A. C. (1995). [Visitor responses to *Wild Cats: Powerful Predators, Vulnerable Prey*]. Unpublished raw data, Michigan State University Museum, Lansing, MI.
- Perry, D. L. (1989). The creation and verification of a development model for the design of a museum exhibit. *Dissertation Abstracts International*, 50, 12A, (University Microfilms No. 90-12186).
- Perry, D.L. (1993). Measuring learning with the knowledge hierarchy. In A. Benefield, S. Bitgood, H. Shettel, D. Thompson, R. Williams (Eds.), *Visitor Studies: Theory, research, and practice, Volume 6, Proceedings of the 1993 Visitor Studies Conference*. Jacksonville, AL: Center for Social Design.
- Wolf, R.L. & Tymitz, B.L. (no date). *A preliminary guide for conducting naturalistic evaluation in studying museum environments*. Washington, DC: Smithsonian Institution.
- Ziebarth, E.K., Smith, S.J., Doering, Z.D., Pekarik, A.J. (1995). *Air and Space encounters: A report based on the 1994 National Air and Space Visitor Survey*. Washington, D.C.: Smithsonian Institution.

APPENDIXES

Appendix A Sources of Data

Appendix B Sample Interview Protocols

Appendix C Words Used In Card Sort

Appendix D Scientists' Stories

Appendix E Questions Visitors Asked About Behind-the-Scenes at The Field Museum

APPENDIX A

Sources Of Data

Sources of Data

<i>Date</i>	<i>Day</i>	<i>Activity</i>	<i>Description</i>	<i>Time</i>	<i>Documents</i>
5/18/95	H	Meeting	project team	90	none
6/8/95	H	Meeting	project team	90	none
6/1/95	H	Meeting	project team	90	meeting sum
6/15/95	H	Meeting	project team	90	meeting sum
6/20/95	T	Interview	w/scientist	60	tran,sum,qu
6/20/95	T	Interview	w/scientist	60	tran,sum,qu
6/22/95	H	Meeting	Project team	90	meeting sum
6/27/95	T	Meeting	Project team	90	none
6/29/95	H	Meeting	Project team	90	meeting sum
6/29/95	H	Meeting	Research	30	meeting sum
6/29/95	H	Interview	w/scientist	60	tran,sum,qu
7/6/95	H	Meeting	Project team	60	meeting sum
7/6/95	H	Interview	w/scientist	60	tran,sum,qu
7/12/95	W	Interview	w/scientist	60	tran,sum
7/13/95	H	Interview	w/facilitator	30	tran,sum
7/21/95	F	Interview	w/facilitator	30	tran,sum
7/19/95	W	Interview	w/scientist	60	tran,sum,qu
7/28/95	F	Interview	w/scientist	60	tran,sum,qu
8/2/95	W	Interview	w/scientist	60	tran,sum
8/3/95	H	Meeting	Project team	90	meeting sum
8/3/95	H	Meeting	Research	60	meeting sum
8/3/95	H	Interview	w/scientist	60	tran,sum
8/9/95	W	Interview	w/facilitator	30	tran,sum
8/10/95	H	Meeting	Project team	90	meeting sum
8/10/95	H	Meeting	Research	60	meeting sum
8/15/95	T	Interview	w/facilitator	30	tran,sum
8/17/95	H	Meeting	Project team	90	none
8/31/95	H	Meeting	Project team	90	meeting sum
8/31/95	H	Meeting	research	60	none
9/7/95	H	Meeting	Project team	150	meeting sum
9/14/95	H	Meeting	Project team	60	meeting sum
9/14/95	H	Meeting	Research	90	none
9/28/95	H	meeting	Research	60	none
7/13/95 - 8/26/95 101 visitor interviews					
7/13/95 - 8/26/95 12 member interviews					

SUMMARY

<i>#</i>	<i>type of data</i>	<i>approx. each</i>	<i>approx. total</i>
101	visitor interviews	20 minutes	33 hours
12	member interviews	30 minutes	5 hours
9	scientist interviews	60 minutes	9 hours
4	facilitator interviews	30 minutes	2 hours
14	project team meetings	90 minutes	21 hours
6	research team meetings	60 minutes	6 hours

Total: 76 hours

APPENDIX B

Sample Interview Protocols

Interview Protocol for Casual Visitors — I The Exploration Zone

number:

gender:

ethnicity:

age:

ranking:

Main question: how do visitors understand what goes on behind the Scenes at the field museum?

Approach visitor

Statement of Confidentiality

Permission to Tape Record

Chitchat:

- ◆ Is this your first visit to the museum?
- ◆ What brought you here today?
- ◆ What kinds of things have you seen so far?
- ◆ What are you looking forward to seeing?

Main Questions:

- ◆ Think back to when you were looking at....What was going through your mind?
- ◆ Is this....real?
- ◆ What % of objects at the Field Museum do you think are real/ replicas?
- ◆ How many objects do you think the FM owns?
- ◆ Are they all on display?
- ◆ What percentage do you think are out on display?
- ◆ Why would the museum have a specimen if not to put it on display?
- ◆ What do you think are behind the doors marked staff only?
- ◆ What do you think is on the 3rd and 4th floors?
- ◆ Have you ever thought about this before?
- ◆ Tell me about how the museum gets its things.
From where? From whom? Who are the people that get them?
- ◆ Where do they work? What do they do? What do they look like?
- ◆ What professions are represented on staff here at the museum?
- ◆ What kinds of educational backgrounds do these people have?
- ◆ Imagine that you are the that someone has discovered.
What would your journey be like to get back to the FM?
Who receives you? How are you transported? Are you stored or displayed? What happens to you?
- ◆ If you could ask and have answered any question regarding what goes on behind-the-scenes here at the Field Museum what would it be?
- ◆ Do you have a science hobby?
- ◆ In general, how do you feel towards science?
- ◆ Do you associate the Field Museum with science?
- ◆ Is it "sciencey"?

Interview Protocol for Casual Visitors — II The Exploration Zone

number:
gender:
ethnicity:
age:
ranking:

Science Questions

- ◆ What do you think of when someone mentions the word "science" to you?
- ◆ Do you have any science hobbies?
- ◆ Do you consider the FM to be about science?
- ◆ Do you have a science story from your childhood?
- ◆ What do the words mean "Natural History" to you?
What do they make you think of?

Scientist Questions:

- ◆ Do you think of the FM as a place that hires scientists? experts?
Why? Why not?
- ◆ How do you think that people decide to become scientists?
- ◆ What do you think scientists are like?
- ◆ Why do you think that people conduct research?
- ◆ Did you ever want to be a scientist? Why or Why not?
Why did you change your mind?

Dead Stuff:

- ◆ Did you see the "Mammals" exhibit?
- ◆ When you were looking at the stuffed animals in the exhibit what did it make you think about?
- ◆ Why do you think the museum has them?
- ◆ Do you think this is O.K.?

Collecting:

- ◆ Do you collect anything or have you ever had a collection?
Tell me a little bit about your collection.
- ◆ How do you think your collection was similar/different to the collections here?
- ◆ Do you think that you had your collection for the same reasons as the FM has their's?
- ◆ Do you do the same kinds of things with your collection that the FM does with their's?
- ◆ How did you go about getting the things in your collection?
- ◆ How do you think the FM gets the things in their collections?
- ◆ If you could ask and have answered any question about what goes on b-t-s at the FM what would it be?

The FM is putting together an exhibit about what goes on b-t-s at the FM. Is there anything that you are especially curious about/ want to learn about?

The Exploration Zone Revised Questions to Ask Scientists

Goal Questions

- What goes on behind the scenes?
- What are visitors' understandings of, knowledge about, perceptions of what goes on behind the scenes?
- What do visitors know about science, and what are their perceptions of science and scientists?
- What do visitors think is interesting about science and scientists?
- What do visitors think is interesting about the Field Museum?

Interviewees can count on the fact that all comments, opinions, and suggestions they make during interviews will be kept confidential by the interviewers.

Primary Questions

1. Describe your research
2. Describe a typical day.
3. What is your most interesting stuff and why?
4. Why do you do what you do at a museum? Why aren't you at a university or any other research institution?
5. Who do you think visitors to the museum are? Are they interested in science? Do they understand that the museum has collections? Do they understand that research goes on at this museum? Do they understand what the research looks like? How do you know these things?
6. What do you think visitors think goes on behind the scenes?
7. What is the most interesting/far-out/dumbest question you've ever been asked by a museum visitor?
8. What is the most interesting thing you do?
9. What is the coolest research that is going on at the Field Museum that you are not doing?
10. Think of another scientist on staff. How would you describe their research to someone else?
11. What are your funny/interesting stories that you tell at cocktail parties?
12. What got you hooked on science?
13. How do you talk to people about science who don't have a science background?
14. How do you talk to people when you are:
 - trying to persuade them about how much fun science is?
 - sharing your science with them?
 - trying to persuade them about how important science is?
 - trying to persuade them about how exciting it is?
15. What is your favorite science joke?
16. What other scientists do you recommend that we talk with?

Secondary Questions

1. What kind of tools do you use?
2. What stuff are you collecting? What kinds of things are you looking for? What is your ideal specimen? When would you think you had gone to heaven?
3. Where are the best places for you to do research/collecting?
4. What do you wear when you work? What do you look like? Do you look like/act like "a scientist?"
5. What is the most interesting thing you think other people think you do?
6. What questions do you get asked all the time about what you do?

APPENDIX C

Words Used In Card Sort

Sampling of Words Used in Card Sort

scientist	Research	microscope
archaeology	Field Museum	artifacts
botanist	paleontologist	systematics
taxonomy	Mummies	fossils
genus	Species	university
coal mine	real objects	collections
field expedition	Exhibits	hypothesis
excavation	Zoology	biological diversity
evolution	Specimens	American Museum of Natural History
Museum of Science And Industry		

APPENDIX D

Scientists' Stories

Scientists' Stories

Getting Interested In Science Scientists shared with us stories of how they got interested in science and research.

Being Interested in English

I actually was most enthusiastic about English. I had a wonderful English teacher in high school. He was really fabulous. He taught me how to read, read critically. And I think that's an important skill in anything...to be able to go below the surface and look for multiple meanings to something....Science has to do that all the time....There really was a valuable tool that I got from that. (S062901)

A Forest Ranger

As a kid...we went camping and did stuff like that. We lived in the city, but we got out as much as we could....I was going to be a forest ranger...until I found out that mainly what they did was clean all the trees. I went to school...to be a forest ranger. I went to the Forestry Department and took a botany course. And the teacher was great, so I fell in love with botany. (S080302)

Visiting The Field Museum

Some of my earliest memories are from the museum. I started coming here when I was in...third grade....We moved to the Chicagoland area when I was in third grade. There are some third graders, normal third graders, and then there is the dinosaur geeks like I was. And they may know as much jargon as I do about dinosaurs. It's hard to keep up with them. (S070601)

Butterflies in Nairobi

When I was growing up in Nairobi I was collecting butterflies. And my mom was really good about saying, if that's what you want to do you should basically go to the local museum and volunteer there and check it out and see what people do for a living. And I also worked for the Animal (inaudible)—ya know feed the leopards and all of that. So there was that interest in me as a child, but also I was introduced to the museum world early....Even then I didn't think much about museums. I was much more into being a game ranger because we'd go out on safari a lot. I wanted to be Ranger Rick. Go be out in the wilderness with big animals. And it was only in California in college when I was volunteering at the museum there that I got into rodents and bats and the smaller things and became interested in that. So whether I would've done that if I hadn't been interested in butterflies as a kid? I don't know. I've often wondered—I mean all of us that work up here on the 3rd floor became experts on birds or mammals—whether that's something that's turned on as a little kid or not; I don't know. We all think that what happens is some kids walk through The Field Museum and see the elephants and they go—hmm—and that's what turns them on. I always make a point of

saying when kids come in and see this... "Ya know you could do this too if you want." (S061502)

Early Reading

There are several books—that are still...in print—that children read. One was "Dinosaurs of the Gobi Desert," by Roy Chapman Andrews, who worked for many institutions....He found a lot of dinosaurs. And they found the first dinosaur eggs, I think, that had been publicized....That's what the book was about....[When I read the book] I didn't know the difference between archeology and paleontology.

But what I liked was the book had two things that it juxtaposed. It had the little finds that he made with the tiny, white, broken bits of shells and the red, sandy earth and the little, slender shreds of bone. And then there was another image that it presented which was as it was long ago when [a] mother dinosaur plodded through the muck and laid her little eggs....You could see the water. It was very good. So you could see the relationship between the evidence and what you could find out. So I said to my mother, "I want to be an archeologist." She did not say, "Not an archaeologist." She said, "Fine." (S080301)

A Day in the Life Scientists shared with us a wide range of stories describing some of what they do at The Field Museum.

Whales Don't Live In the Mountains Anymore

We got drawn to Chile in a real happenstance way, which is often the case in paleontology. I was still in New York at the time. A veterinarian came in on his way from Chile. He was flying back to his relatives in Belgium, stopped on a layover in New York...ran into the museum...walked up to the front desk and said, "I have some whalebones, whale fossils, from the Andes. Is anybody interested in that?"...Imagine visitor services. Some guy walks in who doesn't speak English very well. And we, as a department...will answer every quack question that comes up, because sometimes you find some really neat stuff....So we looked at these pictures, and he had whale fossils from 6,000 feet up in the Andes. Which is pretty surprising, since whales don't live in the mountains anymore. So we went down [to Chile] and...we found some more of these whale bones. The site didn't turn out to be very productive, but...we had planned an alternative. You always have to go with Plan B when you are working in remote areas. And maybe Plan C, D, E, and be very flexible. Anyway...we went and targeted another area which had similar kinds of rocks on geologic maps....We had to have a military boat take us over there and all kinds of stuff. We had a day to zip in and zip out. And we were lucky enough to find a whole new field of fossils with thousands of specimens....[We were able to begin] charting the transition from when this area was under the sea when the whales were living there, to when it began to emerge and had land animals living there. And then we were able to calculate—by knowing how old these rocks are—how fast the Andes had been going up

there....That's really kind of exciting, because we use paleontological evidence to solve a geological problem that other groups had been spending millions of dollars trying to do geophysical surveys to understand the land in a physical sense....We have now made discoveries in four or five different regions. And that's very exciting, because it was a terra incognita. (S062901)

Discovering the Oldest South American Monkey Skull

This was actually imbedded in a rock so that you could just see the edges of the teeth. And we weren't sure it was very interesting....You have to be careful about how much time you spend collecting something....We kind of dug around this thing with hammers and chisels for an hour or two and then popped it off....It broke right through like this, so we could see it was skull, which makes it interesting, because that is fairly unusual.

...We decided to collect it, dug another trench for another few hours with hammers and chisels, and popped it off again. And this time when it popped off it broke along here, and we could see this big, huge fat brain. And my colleague, Andy (Reese) and I were just flabbergasted....We stood there with our mouths hanging down. We both knew what we were thinking, but didn't want to believe it because they are so rare. All the monkey fossils from South America would fit in a baseball cap. There are just so few of them. And so we just said, "Well, could it be—?" We tried to make it every other possible creature so we wouldn't be disappointed. And we still came up with, it looks like a monkey.

...We got it back here and we cleaned up some of these breaks, and we began to see the eyes....They were forward-facing, big, gigantic eyes, which are only found in primates, so we knew we had a monkey at that point. We then put it through a CAT scan so we could see what it looked like before it came out of the rock, because it takes about a year to a year and a half of one person sitting there under a microscope with a needle picking it away grain by grain—but you do it because it's a very important specimen. (S062901)

We Write the Books

Another thing...that people don't realize [is] how hard it is to put a name on a given specimen. They think well you just go and look it up in the book, right? Well, but we're the guys who have to write the books. And that 's very true. That's the way I put it. A lot of museums, in fact, are basically like kids' school science fairs. They go and look up some stuff in books and they make some really cool posters and displays and maybe a little demonstration about it and then they put it on display like a high school science fair. But ya know, we're the people that are writing the encyclopedias that are finding out the cool stuff to put in the books so they can look it up. There's a difference between this kind of a museum that has such a major research component and a museum like Science and Industry. There's no research there. They just...look stuff up in books and think of cool ways to show it and explain it. It's a teaching function, but they're not learning the facts. They're merely conveying them. We're trying to do both here. We're trying to learn new stuff and convey it also. (S061501)

Going to See Jurassic Park

The museum went as a whole [to see the movie Jurassic Park]. I don't know how many people at the museum. But the museum arranged for a showing at McClurg Court. They rented one of the theaters in McClurg Court. I loved it. It was great. There was one scene that I enjoyed in particular. That's where they are—Very early on in the movie they go out to a field site and they show them using whisk brooms, just dusting the rock away from the fossil. And all of us that were there had a howl over that. You know, what they did would in fact in the lab take several months. (S070601)

A Rotting Zebra

When I first got here 6 years ago, I was kinda finding my way around and I uncovered this vat and somebody had left a zebra from the zoo in there....The first thing I saw was a carpet of maggots that was about this thick....I pulled the bag out because if it stays in there too long the bones will fall apart....It was just the most disgusting thing you've ever seen in your life. What I didn't realize was this vent right here sucks the air straight into Stanley Field Hall and...this is the exact time when The Women's Board...were having their annual tea....Here were all these ladies, all decked out in formal attire and this smell of rotting zebra just comes wafting across Stanley Field Hall....Pretty soon you just see these ladies in these gowns just up and down, out the North Door and down the steps. The phone started ringing. It was security, "What are you doing up there?" I had just enough wits left about me to say "Nothing," went off, left the building, wouldn't come back for about 2 days, just to let the heat blow over. (S061502)

Moving the Great Whale

The great whale skull came from Humboldt which is in Northern California....Museums often trade things....Raccoons are very common here but in East Africa they don't have raccoons. They have fruitbats for instance. We don't have fruit bats here. So they have a lot of fruit bats, we have a lot of raccoons. We'll take a raccoon over to them, they'll give us a fruit bat. Both institutions are like "this is great"....That's what happened with the great whale skull. We didn't have one here and it's a very primitive family of whales—the great whales...Humboldt didn't have a flying lemur which is this thing in southeast Asia that's kind of weird, so we gave them a flying lemur. It was a pretty good trade. But the lemur was this size and I was able to take it carry-on on the plane wrapped up. I couldn't carry the great whale back on the plane—it was just huge—so I rented a drive-away car....The people who wanted the car moved from Sacramento to Chicago had no idea. I didn't tell them of course. I just gave them the deposit and drove back to my friend's house. There was this great whale that still had rotten flesh hanging from it. We wrapped it up in bags and shoved it in the back seat of this Monte Carlo and took off across the Great Basin in the middle of summer. It took 5 days to drive this thing across. I had a

vulture that followed me for about 3 states....[I] had to buy Glade and Odoreaters and everything else to shove in the car so the stench would go away. (S061502)

Scientists Correcting Mistakes

And they specifically said there were no bi-facial projectile points, which we have been talking about. And the idea was that you could not live in the tropical forest. The hunting and gathering alone is too poor. Which is not true. But it's not enough for me to say that is a stupid idea, I'm sure that's not true. I have to show it. It's not very hard to do. Of course, all I did was look at the museums and I found lots of bi-facial projectile points. That's when I said, wait a minute, those guys never even looked through the museum collection. And so you find that you can make a contribution in science, because a lot of people are sloppy or they are really not interested and they talk rather casually about something they haven't really looked at. And that's what you may be interested in, so you can do something. (S080301)

Trample Over The Landscape and Look, Look, Look

Well, just a word about what you do in the field. There's different things you can do. Sometimes it's very specific. But let's start with a brief general. What you do is—your question is, how did people adapt in different periods? And so you know what the kind of material is that relates to different kinds of periods, at least in principle. And so you look for sites like that. You use human knowledge. Local people who know about sites, and you use the old sources and you trample a lot all over the landscape and look, look, look. (S080301)

Studying the Present

I'm a social anthropologist....My research is contemporary issues of culture change rather than what most of the other curators do, which is archeology, which looks at issues of change in the past. What is evident about a culture from a material record. My research is more focused on looking at patterns of social organization, social identity as they are shaped by the forces of the present. What is happening today.

...I have done two different kinds of research. One kind of research was on the issues around rapid social change in the tropical rain forest—Central and South America—and the impact of that on the indigenous peoples who live in that area. And the second research I have done most recently, is on issues around social change in urban areas of the United States....What kinds of conflicts arise, what kinds of ways...the social change that is going on in urban areas affect conceptions of identity in the U.S. Those are the two different kinds of research that I have done. (S072801)

Living Collections

I also hope to be able to relate some of the contemporary social anthropology I do...to the type of collections that we have here in the museum so that the museum has more living collections, or collections of contemporary things, [so] that it

expands beyond collecting just artifacts....For example [I am] collecting oral histories from people in this area...and having them hear it, being a repository of oral history that will document change in Chicago. [I am] collecting videos of various sorts similarly, so that by adding—and beginning—the collections of contemporary life in urban settings to...the general collections that we already have here. (S072801)

Connecting with Visitors Scientists also talked with us about strategies they use when talking with people, and explaining what they do.

Visitor Questions

Almost everybody ends up having questions about some particular thing that they have seen or that they are interested in....With the bat exhibit people want to know "What are the bats that I see in my yard? How can I get more bats to live in my yard?" Immediate, practical kinds of things. But often when they ask what sorts of things I do...[and] I tell them I work on evolution, ecology and conservation in the Philippines they say, "Good Lord, why do you go there? Why so far?" And "Is it interesting? Is it dangerous?" That kind of thing. "So what is the outcome? What do you do that is something that is of interest to me?" ...Being able to relate things to people in a way that tells them, "Hey, this is something that does have some implication for your life," clearly makes a big difference. They really do like that. (S071201)

Scientists Are Collectors

[When I talk with visitors about why I do what I do] it basically falls back to... "Well, I just enjoy it." Ya know, that really is—for a lot of people—a very powerful sort of argument...for sort of regular folks. They understand enjoying stuff. They have hobbies. "You like going fishing, you like going hunting? Well, I like collecting plants."..."You like collecting butterflies? You like collecting postage stamps, or beer bottle caps? Well, I like collecting plants."...They understand...the inherent interest...the sort of the hobby thing. What they find incredible is that someone will pay you to do it. (S061501)

2 Million Dead Plants

I usually tell them I'm in charge of 2 million dead plants....That kind of interests them. And when you say, "2 million plants," they think of...a giant conservatory full of live plants. It's "No, they're all dead. The deader the better for us." ...There's so much in the news about...the disappearing...Rain Forest and the Amazon [so] I try and connect with that, saying, "Well, before things disappear, we're trying to record what's there so at least we have some knowledge of the types of vegetation that are disappearing." At least there's some information, and...you can get information from a dead plant. You can extract DNA. (S071901)

Grabbing People By the Lapels And Saying LOOK!

In terms of the excitement of the place, I think showing kids the beetle room or showing people a penis bone is their terms. Talking about the rotting of the skeleton in the back. I mean it may not spin your prop, but at least it's interesting, right? You meet somebody that actually takes a bath in rotting zebra ...how does that sound compared to somebody who's studying the myology of the femurs of equis greveii? No, no. You grab people by the lapels and say, "Look!" ...I know that there are a lot of people that go "Oh my God, that's disgusting!" But I think that when we do that we've hit—we've driven the message home a lot more than somebody who just tunes out the scientific words....My theory is that once you grab somebody and...you get their attention like that—like penis bones—then you can talk about how they differ and why they differ...."So you've seen this change on these 4 different mountain tops. The penis bone has evolved in 4 different directions. That's evolution." So suddenly a scientific word that people hear all the time suddenly has this really interesting [meaning.]

The importance of all the biodiversity...is probably the most important message...—and one of the hardest for me to get across because I love wilderness. I mean, if we could save every last bit of wilderness left on earth right now I'd be the happiest guy on earth. And it pains me greatly to think that the possibility is there. And other people'd say it's not a possibility, it's absolute reality that we're gonna lose the vast majority of what's left. In fact we've already lost the vast majority and...we're still gonna lose a lot more....I love all that wilderness. I love all the different animals whether it's banana slugs, whether it's bacteria, whether it's mosquitoes, whether it's spotted owls, but how to convince somebody else that it's important that we keep all of those different organisms is a difficult thing. (S061502)

Making Things Matter

It's a case where I can talk about discovering a new species, finding out its basic ecology, recognizing that it was endangered, understanding what the causes of the endangerment were, and what the impact of that is on people....Those kinds of stories are things that people said "Yes, okay. I see. This matters." It's interesting. It's a cool bat, but it also makes a difference. (S071201)

Characteristics of Scientists One scientist discussed the role of curiosity.

Scientists Are Curious People

Basically, what anybody in our line of work...is driven by is just an inordinate sense of curiosity. They're just incredibly curious about stuff. They're always asking "How come is that? Why is that? Why does this work that way? Where did this come from?"...They try to construct ways of figuring out how things got to be this way or why it is this way. I think [this sense of curiosity is] probably more highly developed in scientists, maybe. But I think it's certainly...an innate human way of looking at things....People are just naturally...curious about things....We look at the world around us and say "Gosh, look at all these different

kinds of plants and animals. How come there are so many different kinds? Why isn't there just one or two kinds of animals and six or seven kinds of plants? Ya know, why is that?" and you start trying to figure out answers to these questions. How did the situation we see come to be? That's sort of the major question that a lot of us basically in the three biological departments are asking. How did things get this way? (S061501)

Additional Interesting Stories Finally, some scientists told us interesting stories that don't really fit in any of the above categories but we felt should be included anyway.

Coming Across Miss Brooks

It's always interesting to find something collected in the 17, 1800's....There's a woman. Her name is Miss Brooks. And I don't know who she is. I don't have a history on her. One day I'll have to sit down and find out....You'll find her collections popping up. The other day I found one [she collected] somewhere in Asia. And then she collected in Bolivia....Her collections are like in the 50's. For a woman to be going to these sort of "exotic places" and collecting plants, [it just seems] kind of unusual.

And then there's another woman, Marjorie Carlson, who collected a lot in Mexico and, I believe, Central America. Marjorie was early 1900's. Earlier. Like maybe 20, 30. There are some interesting names and we say, "Oh, I wish I knew a little bit more about that particular collector." I think the women collectors really stand out for me just because it's so unusual to have sort of like a pioneer woman. I could just see her climbing the mountains of Bolivia collecting specimens. And you wonder, you know, why she did it or who she was. I have to look her up one day. (S071901)

Chipmunk Phalli

I studied chipmunks in the Western United States. And to show you how perverted I really am...I studied their phalli. Most rodents—and most mammals for that matter—...have a bone in their penis...This is the bone of the chipmunk right here. ...Notice the really weird shape?...It's got this little key over here and this angle? It turns out that...this bone is very conservative in terms of its shape for each population it comes from...I looked at actually 4 different populations of chipmunks. When I put the skins next to each other I couldn't tell them apart. When I took the skulls and put them next to each other, I couldn't tell them apart. When I put the penis bones next to each other and did a statistical analysis on 8 different measurements that I took, it came out like night and day....It's turning out that this is very useful for us as systematists....I went into 4 different mountain ranges where I got these chipmunks....They were isolated on these mountain ranges so they couldn't meet each other....And they'd been like that for about 10,000 years. But back in the Pleistocene when [the] climate was a lot cooler and wetter, the habitat that's on these mountains now was able to come a lot lower and connect....So all the chipmunks could run around, skip freely through the woods, and do their thing. Then the glaciers receded. The Great Basin now

*is just a desert, so all that area down in the lowland dried up and you had these islands...of habitat, surrounded by this sea of desert. The chipmunks can't see each other, and so they evolve their own separate directions. Now 10,000 years is nothing in terms of evolution but it was enough for this bone to change.
(S061502)*

APPENDIX E

Questions Visitors Asked About Behind-the-Scenes

Questions Visitors Asked About Behind-the Scenes at The Field Museum

Exhibits

How do they figure out what the next feature is going to be? Do they give out surveys asking people what they are interested in? (082303)

Do they have exhibits that change? (080303)

How do they come up with ideas for new exhibits? And how does The Field Museum decide what to exhibit? (082502)

I'd like to see an exhibit being built. Every once in a while, that happens....And that was very interesting. And it's almost like I'd love to see the whole thing being built, you know, instead of being so enclosed. I think it would really be an educational service to see all of that. (080102)

I would wonder how you decide you're going to design everything, because you have a limited space. And a lot of the things are pretty big, like, you know, the mammals and different things. You think, well, how am I going to put this where it's aesthetically nice looking, but people can still look at it and it's not too crowded or anything. (080206)

How do they decide which exhibits they're going to put up and why? How do they know what would be of interest to the public? (081606)

I'd like to know how they decide which exhibits they're going to put on. (080104)

Who comes up with ideas for exhibits and activities? What is the process like? (082601)

What is the average time it takes to design and display an exhibit? (081805)

I think my major question is with what you have out, how much isn't out? And how is that decision determined and how does it get rotated, or does it ever get rotated? That type of thing....I would be very curious to see how that went from a design to a real setting. (082503)

The question is how difficult is it for them to present [things in exhibits] to the public in a logical way. (082504)

Specimen Handling and Preparation

I'd love to see how they age things. I'd like to see it done. I've heard of carbon dating. (080205)

How do they preserve some of the items? (080201)

How do they put dinosaurs together? (082205)

How do they prepare the dinosaur bones for display? (082102)

Also, how do they get the dinosaurs and elephants in through such little door ways? (073103)

Are the ocean animals and the water backgrounds made of wax? (080203)

How long does it take for you to put a dinosaur together? A big dinosaur? (080105)

How do you put bones together? How do you know how to identify that bone A goes with bone Z? He would like to see carbon dating. (081801)

How long does it take to put together a dinosaur skeleton from start to finish? What [did] they [do] to assemble it? (082305)

Cleaning

How do they clean exhibits? (0822603)

Who dusts the exhibits? (082506)

How do they keep everything so clean? (081804)

How do they keep exhibits clean? (081802)

For me, it's just fascinating that they keep this place clean. (080206)

Acquisitions

How do they get animals and where do they come from? (082301)

Where do you get some of the stuff and how? I didn't think Indiana Jones existed. (082605)

How do they get permission to display someone's dead body? (mummies) (082604)

How do they pick out what they want to find? (082206)

When in the field, how much time does it take to find something? And do they take whatever they find or are they looking for something in particular? (082202)

How do you all come up with all that? Or how did you all ever get the idea that these things was, ya know, still around? Or how did you all ever discover 'em? (073101)

Where and how did The Field Museum get the animals in the Nature Walk? (082306)

I would like to know if they are still having people working to find fossils around the world. (080204)

Where do you find all the things at The Field Museum? (082201)

Where do they get everything? (081702)

How do they find mummies and stuff? (081605)

Who DOES get stuff? (080101)

Where do you get the stuff? (082104)

Where do they get dinosaur bones from? (082205)

How did you get everything in here? (082501)

Where do they get all this stuff? (080103)

Working at The Field Museum

What is it like to work at The Field Museum, to know all the stuff—not just the paragraph on the exhibit? (081803)

Are people working here for the money or do they have an interest in what they do? (082101)

I'd certainly be interested in one question. How many people it takes to run the show. (073103)

How does a student go about getting a position to do research at The Field Museum? (080202)

How do scientists have the patience and effort to do this work? She was especially curious about the questions that scientists ask themselves when they're doing research. (081701)

I would be real interested in how they balance their research in being an institution like this, as opposed to a straight research institution. (080101)

Miscellaneous

What is the ultimate purpose of the person who's in charge of The Field Museum? What is the goal of that individual? Or is that goal never-ending? (082203)

Who are the architects of this place because it's really pretty. She is especially curious about how The Field Museum owns everything. (081607)

Are there people that try to break in to The Field Museum and steal things? (082103)

Storage

I'd like to see the storage. I'd like to see a storage area really happening. (080102)

Where's the catacomb of stuff? (082302)

How do they keep track of things in storage? (082505)

What do you do with the 98% of stuff not on display? (082602)

What do they do with the stuff that's not on display? Who decides if the stuff goes on display? (082606)

Content

What's the latest discovery on the origins of Man? (082304)

What is the meaning of life? Scientists here have an opinion on that. (082204)