**Summer Visitors to**
*The Janet Annenberg Hooker Hall of Geology, Gems, and Minerals*
**at the National Museum of Natural History**

**INSTITUTIONAL STUDIES**

Smithsonian
Institution

**Summer Visitors to**
*The Janet Annenberg Hooker Hall of Geology, Gems, and Minerals*
**at the National Museum of Natural History**

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Report 99-1

# Acknowledgements

# Table of Contents

## List of Figures

## List of Tables

# Introduction

On September 21, 1997, the National Museum of Natural History (NMNH) reopened its permanent exhibition of geology and gems – *The Janet Annenberg Hooker Hall of Geology, Gems, and Minerals* (GGM). The museum and the exhibition team had given much thought to the visitor experience during the development, design and construction of the new hall. Upon completion and presentation to the public, the museum and the team turned to the Smithsonian's Institutional Studies Office (ISO) for focused studies of visitor experiences within the renovated exhibition. This document presents the results of these studies.

The studies designed by ISO were conducted in late May - July of 1998, the time of the peak summer audience. Previous work by ISO has demonstrated seasonal patterns in the number of visitors coming to NMNH as well as in the characteristics of these visitors.[1] Visit counts are at their peak in the summer months and at their lowest point in the winter. Though U.S. residents from outside the DC Metro area dominate the audience throughout the year, visitors from the DC Metro area comprise less of the audience in the summer than in the winter. Groups of adults with children are more likely to visit in the summer (when they make up more than half the audience) than in the winter (when they account for less than half of the audience). Other visitor characteristics remain fairly stable across the seasons, including whether a visitor is making a first visit, visitor age, and educational attainment.

Due to the cyclical nature of visit patterns to NMNH, additional follow-up studies in other seasons will be conducted to give a complete picture of the visitor experience in GGM.

## The Exhibition

*The Janet Annenberg Hooker Hall of Geology, Gems, and Minerals,* named in honor of its major donor, is a comprehensive Earth sciences complex. This permanent exhibition opened as a *Hall of Gems and Minerals* in 1958 and grew to encompass geology, moon rocks and meteorites in 1971 with the addition of *Our Restless Planet.* The current modernization was begun in 1995.

The 20,000-square-foot hall features the Hope Diamond, displayed in the Winston Gallery, and the National Gem Collection (displaying gems and jewels). The exhibition also includes a minerals and gems gallery featuring cut and uncut specimens; the recreation of four working mines; the rocks gallery which explains the destruction and creation of rocks by Earth's natural processes; a major exhibition on plate tectonics demonstrating how the sliding and shifting of Earth's crustal plates causes earthquakes and volcanoes; and a gallery devoted to the moon, meteorites, and the solar system.

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[1] Bielick, S., Pekarik, A. J., & Doering, Z. D. (1995). *Beyond the Elephant: A Report Based on the 1994-1995 National Museum of Natural History Visitor Survey* (Report No. 95-6B). Washington, DC: Smithsonian Institution.

## Research Plan

The summer research program for GGM called for two types of studies: unobtrusive observation and survey interviews.

The observation study determined how long visitors spent in the exhibition and how they divided their time within the galleries. We expected to find that the Hope Diamond display in the Winston Gallery would be an immediate draw for visitors and that the majority would begin their visit to GGM there.

The interview study surveyed entering and exiting visitors to collect data on their characteristics and the kinds of experiences they found most satisfying in the exhibition and in the museum. We expected to find a population similar to that which visits the museum as a whole.

As a supplement to the interview study, we engaged a separate sample of entering and exiting visitors in conversations about gems, minerals and rocks as they examined specimens similar to those found in the exhibition. We expected to find that conversations with visitors after their visit to GGM would include more (and possibly more elaborate) descriptions of the specimens and their origins.

## Report Organization

Following this introduction are summaries of all studies. A section on methodology introduces the complete observation study and the complete survey study. Each complete report is accompanied by supplementary tables. The report concludes with the maps, forms and questionnaires used to conduct the studies.

# Observations of Summer Visitors in
## *The Janet Annenberg Hooker Hall of Geology, Gems, and Minerals*
### Summary & Discussion

## Overall Behavior

The 185 visitors we observed spent an average of 14.8 minutes (*SD*=14.5 minutes) in the exhibition rooms. On average, 7.9 minutes (*SD*=9.6 minutes) were spent viewing the exhibition and the remaining time was spent between stops. Surprisingly, different social groupings spent very similar periods of time in the exhibition.

Visitors made an average of 12.9 stops (*SD*=12.3 stops) during their visit. The average stop time at a specific element was under one minute, (0.7 minutes, *SD*=1.1 minutes). The median stop time was less than half a minute (0.4 minutes). Groups of adults tended to make more stops than adults with children or individuals visiting alone.

Movement through the exhibit was not always linear. Approximately one-third (63 or 34%) of visitors returned to see a particular exhibition element more than once. Return stops were most common in the Minerals & Gems Gallery.

## Overall Patterns of Gallery Usage

Each gallery in the exhibition held visitors to a different degree. Within the first four galleries (Winston Gallery, National Gem Collection, Minerals & Gems, and Mine), we can identify three major patterns of gallery usage:

- Visitors who spent less than 10 minutes in the exhibition as a whole spent more time on average stopped in the Winston Gallery than in any other.[2]
- Visitors who spent between 10 minutes and 35 minutes in the exhibition spent more time on average stopped in the National Gem Collection.
- Visitors who spent more than 35 minutes in the exhibition spent more time on average stopped in the Minerals & Gems Gallery.

Except for the one in twelve visitors (8%) who spent 35 minutes or more in the exhibition, all visitors spent an average of about 2 minutes stopped in the Winston Gallery, no matter how long they spent in the exhibition as a whole.

No matter how long visitors spent in the overall exhibition, they spent relatively little time in the Plate Tectonics Gallery, and the Moon, Meteorites & Solar System Gallery, compared to the other galleries. In fact, the longer visitors spent in the entire exhibition, the smaller the proportion of their stopped time that was spent in the final two galleries.

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[2] There is one exception. Those who spent less than 5 minutes in the exhibition spent on average about as much time in the Meteorites Gallery as in the Winston Gallery. These quick Meteorite Gallery visitors presumably entered the exhibition at the back end.

Different proportions of visitors made <u>at least one stop</u> in each of the galleries:

- 74% in the Winston Gallery,
- 67% in the National Gem Collection,
- 51% in the Minerals & Gems,
- 34% in the Mine Gallery,
- 14% in the Rocks Gallery,
- 12% in the Plate Tectonics Theater,
- 24% in the Plate Tectonics Gallery, and
- 25% in the Moon, Meteorites, & Solar System Gallery

We also attempted to determine if the movement through the exhibition, especially the third section (Minerals & Gems), was along a path designated as the "Fast Track" or incorporated stops on one side or the other. No one was found to make purely, or even mostly, "Fast Track" stops. Visitors simply incorporated them into their path through the gallery.

Types of Elements

People visiting the exhibition alone were more inclined to stop at panels. Adults with children examined touchables more than other subgroups. Men with children were more likely than other subgroups to stop at the computer interactives, while men alone were the most likely to watch a video.

Specific Elements/Icon Visitors

The Hope Diamond stands out among specific elements. Nearly three-fourths (73%) of the visitors stopped at the Hope Diamond.

In the renovation of the Geology, Gems and Minerals Hall, the Hope Diamond and the National Gem Collection were moved from deep within the Hall to a location at the entrance, providing visitors who only wanted to view these items with an easy way to look at them and go on their way. More than a third (35%) of the visitors were "Icon visitors" who took this option (visiting only the Winston Gallery and the National Gem Collection), compared to those who moved beyond the first two galleries ("General visitors").

There were no significant differences between Icon visitors and General visitors based on demographic characteristics except for age. Visitors who were 40 or older were more likely to be Icon visitors.

Discussion

The tracking study suggests that visitors are treating GGM as if it were comprised of three linked exhibitions, each with its own level of interest:

- The first and most popular exhibition-segment is "Gems," consisting of the Winston Gallery and the National Gem Collection. More than 4 out of 5 visitors (87%) stopped at least once in one of these two galleries, and over one-third (35%) of visitors ended their visit to the exhibition with these two galleries.

- The second exhibition-segment is "Minerals," consisting of the Minerals & Gems Gallery. Four out of five (78%) of the visitors who moved on to this gallery made at least one stop there.

- The third exhibition-segment is "Geology," consisting of the Plate Tectonics Gallery and the Moon, Meteorites & Solar System section. Only 55% of visitors entered this section. Of those who entered, 37% made at least one stop in one of these two sections.

The sharp drop-off in attention after "Minerals" is probably due to what visitors had anticipated when they entered. Above all, it seems that they were expecting to see the gems, especially the Hope Diamond. Those with deeper levels of interest stayed on for "Minerals." The relatively weak response to "Geology" might be very different if that end of the exhibition had its own distinctive external signage, so that it could draw visitors who are more excited about volcanoes, meteors, comets, and the solar system than they are about gems.

The "Fast Track" did not play a role in the visit probably because Icon visitors (those who presumably would have been most interested in a Fast Track) had already left the exhibition before they reached the Minerals & Gems Gallery. Since the Winston Gallery and the National Gem Collection had exits directly to the balcony, these two galleries functioned, in effect, as a "Fast Track." Anyone who went beyond them was already interested, had time, and didn't need (or want) a "Fast Track."

# A Survey of Summer Visitors Entering and Exiting
## *The Janet Annenberg Hooker Hall of Geology, Gems, and Minerals*
<u>Summary & Discussion</u>

## <u>The Visit Context</u>

Over half (57%) of the 314 visitors we interviewed were making their first visit to NMNH. One quarter of all the visitors (24%) had been to the museum's geology and gems exhibition at some time in the past (7% of all visitors were returning to the new installation).

Over half (53%) of the visitors entering GGM had come to the museum intending to see the exhibition or the Hope Diamond.

## <u>The Visitors</u>

The majority (75%) of GGM visitors live in the United States outside of the Washington, DC Metropolitan Area; the rest of the visitors were divided between Metropolitan residency (14%) and foreign residency (11%). Less than one in five (15%) of GGM's U.S. visitors identified themselves with a minority racial/ethnic group.

Slightly more women (52%) than men (48%) visited GGM during the survey period. The average age of all GGM visitors is 36 years.

Almost half of the visitors (47%) came to GGM in a social group of adults and children. Over half of GGM adult visitors, age 25 or older, had attained a Bachelor's degree or higher (53%) and 21 percent had earned an Associate's degree or had some college experience.

## <u>The Visit</u>

Visitors estimated that they spent, on average, 30 minutes inside the exhibition. (This is twice the average recorded visit time of visitors observed in the exhibition -- 15 minutes.) One in five exiting visitors indicated that they had visited only the Winston Gallery and/or the National Gem Collection. (This is approximately half the percentage of visitors who were observed visiting only these two galleries – 35%.)

Of people who visited all six main galleries, one third (31%) chose the National Gem Collection as the most interesting gallery, and 23 percent chose the Mine as the least interesting gallery.

Four out of five (82%) visitors felt that at least one of the galleries was crowded. More than two out of three visitors (69%) said that crowding in the galleries negatively affected their visit.

The types of information visitors found most interesting fall into two main categories: qualities intrinsic to the object (scientific/geological, 58%) and cultural information (social history/ownership/value, 32%).

About half (48%) of the visitors exiting GGM reported that they had visited exhibitions about geology, gems and minerals in other museums. They told us that GGM was different from these other exhibitions in its size and in the quality and breadth of the collection.

## Exhibition Messages and Educational Objectives

As visitors left the exhibition they were asked, "What did the exhibition as a whole suggest to you personally about the earth?" According to the GGM team's gallery-by-gallery outline of major messages, the overall theme of GGM is "the dynamic earth". Unprompted, 15 percent of exiting visitors told us that the exhibition suggested that the earth is dynamic and complex. Though a simpler message, the suggestion that the earth is old (given by 10% of exiting visitors) might also be classified under the theme of the dynamic earth.

The GGM team had also identified four educational objectives for the exhibition. These are stewardship, knowledge, appreciation, and scientific thought. Responses to the question about the earth can be classified into the first three of these four categories: 14% of the comments could be classified as stewardship, 25% as knowledge, and 50% as appreciation.

## Satisfying Experiences within GGM

Visitors exiting from GGM were asked to select from a list, in order of importance, their three most satisfying experiences in the exhibition. The leading experiences, each selected by more than one-tenth of the visitors as their most satisfying, were:

- I gained knowledge or information (20%).
- I saw unusual things (17%).
- I saw my children learning new things (16%).
- I was moved by beauty (13%).

To facilitate analysis, we excluded "children learning," and then grouped, or clustered, those types of satisfying experiences that were frequently mentioned together by visitors. The technique identified four types of experience, which we called Cognitive (38% of visitors chose one of this type of experience), Object-Oriented (32%), Interpersonal (18%), and Dreaming experiences (11%).

Discussion

The survey study, like the observation study, indicates that GGM visitors were especially focused on the gems. Overall the National Gem Collection was the most visited gallery, the most crowded gallery, and the most interesting gallery, while the Mine was considered the least interesting gallery. Even so, visitors whose most satisfying experience in the exhibition was learning something tended to be a little more interested in the mine and a lot less interested in the National Gem Collection.

The amount of time that visitors spent in the exhibition as a whole seems to have an important impact on what it suggested to them about the earth. Although visitors over-estimated their time in the exhibition by a factor of two, we can separate them into the fastest third (those who said they spent less than 15 minutes), the middle third (16 to 40 minutes), and the slowest third (over 40 minutes). The fastest visitors were most likely to say that the exhibition suggested that the earth is dynamic or old; the middle third of visitors were most likely to express appreciation for the earth's beauty, complexity, power and wonder. The third who spent longest in the exhibition were most likely to say that the exhibition suggested the earth's abundance, variety, richness and fragility. Unfortunately we cannot say whether this reflects an effect of the exhibition or the predisposition of visitors.

As in the observational study, one of the most striking results here is the relative lack of enthusiasm for the Plate Tectonics Gallery and the Moon, Meteorites, and Solar System Gallery.

The satisfying experiences reported by visitors suggest that the exhibition effectively balanced information and object presentation. Out of every ten visitors, four said that their most satisfying experience was cognitive and three said that their most satisfying experience was an appreciation of the objects. The data can also be seen as suggesting that satisfying interpersonal experiences may have been adversely affected by the crowding in the National Gem Collection.

# Methodology

This section discusses how the studies were conducted, including the schedule for data collection, sample selection procedures, and completion rates.

<u>Obervation Study</u>

<u>Design</u>. Data for this study were collected by unobtrusively observing visitors as they entered the exhibition through either the National Gem Collection or the Moon, Meteorites, and Solar System Gallery. Data were collected during seven alternating days between May 17 and May 30, 1998. Three sessions of observations were conducted on each day.

For this project we used a "continuous sampling" technique, a special procedure developed for sampling a mobile population.[3] We used teams of two or three people to track visitors. Observation was restricted to voluntary visitors, age 12 or older; i.e., individuals clearly visiting the museum as part of a group were not selected for tracking.

Data collected included detailed information describing the path taken through the exhibition, galleries visited, locations stopped at, and activities engaged in, as well as some limited demographic information (gender, group composition, approximate age, and race/ethnicity by sight).

<u>Sample Design and Selection</u>. Observations were conducted every-other day and, within each day, there were three sessions (10:30 AM -12:00 PM, 1:30 PM - 3:00 PM, 3:30 PM – 5:00 PM.).[4]

Sample selection followed procedures established by ISO for its studies.[5] Teams of three individuals – one acting as a team leader – collected data during each session. The team leader had two major responsibilities: (a) to count and record the number of people approaching the exhibition during 15-minute intervals, and (b) to identify individuals to be tracked. An imaginary line was selected near the interviewing location to clearly define who was approaching the exhibition. The team leader recorded the ongoing tally on a Sample Selection Form with the help of a mechanical counter and a watch. A tracker training manual was developed for the study.[6]

Smithsonian staff and contractors, members of formal tour or school groups, and people ineligible for the study because they were not making a GGM visit (e.g., looking for family or group members in the vicinity of the exhibition) were excluded from the studies. For logistical and technical reasons, interviews were not conducted with members of school or tour groups. Thus, our data pertain to "voluntary visitors."

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[3] The procedure and its rationale are described in Z. D. Doering, A. E. Kindlon and A. Bickford, *The Power of Maps: A Study of an Exhibition at the Cooper-Hewitt National Museum of Design*. Report 93-5. (Washington, D. C.: Smithsonian Institution, 1993).
[4] The schedule is on file, ISO.
[5] This method of selecting a sample keeps the interviewers fully occupied, compared to an equal interval selection method; the counter is essentially incorporating a self-adjusting selection interval.
[6] On file at ISO.

<u>Implementation</u>.  One hundred and eighty-five (185) systematically selected individuals were observed (unobtrusively tracked) from the time they entered the exhibition until the time at which they exited the exhibition.  Observers (trackers) used specially designed maps and forms (see Appendix tk) in conjunction with stopwatches to record the data.

A total of 244 exhibition elements were included in the observation protocol.  An element was any distinct museum artifact ("real thing"), created artifact (e.g., jewelry fashioned from precious gems and metals), or communication medium, such as a text panel, large photo, video loop, or interactive.  The elements and sections of the exhibition were collaboratively identified by the exhibition team and the Institutional Studies Office.  The purpose of identifying the locations at which visitors stopped, and the time they spent at various elements, was to collect data that would aid in understanding how and where visitors spent their time in the newly renovated GGM Hall.

All stops made by visitors at any of the 244 exhibition elements were recorded.  A "stop" was recorded if it was at least three seconds in duration.  In addition to behavior, a few demographic characteristics were recorded from observations.

## Interview Study

<u>Overall Design</u>.  Data for this study were collected in personal interviews, approximately 10 minutes in duration, with "entering" visitors as they approached the exhibition entrances and "exiting" visitors as they emerged from the exhibition through either the National Gem Collection or the Moon, Meteorites, and Solar System Gallery.  Data was collected during seven alternating days between July 22 and August 1, 1998.  Four interviewing sessions were conducted on each day.

Supplemental interviews engaged visitors in conversations about gems, minerals and rocks ranging in length from 5 to 20 minutes in duration.  These data were collected during seven days between June 17 and June 30, 1998.

As in the Tracking Study, the "continuous sampling" technique was used in this study.[7]  Visitor cooperation with the study was high; a total of 314 interviews or 87% of eligible intercepted visitors completed interviews.  The supplemental survey gained the cooperation of 80 percent of those eligible.

In preparation for the main study, preliminary interviews were conducted with about thirty visitors.  As a result of these interviews, and after consultation with NMNH staff, we developed the major topics for the questionnaire.

The questionnaire for the main study collected four types of information: characteristics of the individual, information about the visit, experience in the exhibition, and the satisfaction experienced during the visit.  The questionnaire also included a section for

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[7]  The procedure and its rationale are described in Z. D. Doering, A. E. Kindlon and A. Bickford, *The Power of Maps:  A Study of an Exhibition at the Cooper-Hewitt National Museum of Design.*  Report 93-5. (Washington, D. C.: Smithsonian Institution, 1993).

recording administrative information. This included the time, date and location of the interview, and the reason, if applicable, that an interview was not completed (e.g., Smithsonian employee). An interviewer training manual was developed for the study.[8]

Sample Design and Selection. Interviews were conducted every-other day and, within each day of the main study, there were four interviewing sessions (11:00 AM -12:00 PM, 1:00 PM - 2:00 PM, 2:15 PM - 3:15 PM, and 3:30 PM - 4:30 PM.).[9] In the supplemental study, two interviewing sessions were conducted on each day (10:30 AM - 12:30 PM and 2:00 PM - 4:00 PM.

Sample selection procedures were identical to those described for the Tracking Study.

Data Preparation and Coding. The questionnaires were reviewed in the office to ensure that the data file included the appropriate information for weighting the data. The data from the supplementary study were transcribed for analysis.

Completion Rates and Response Bias. Of the 362 individuals intercepted in the main study, 314 completed interviews. Thirteen percent of people intercepted refused to participate in the survey. While a few refusals were due to language difficulties, the majority of refusals were for "other" reasons (e.g., visitors in a hurry, not wanting to detain companions, etc.). In the supplemental study, the refusal rate was somewhat higher. A total of 138 individuals complete interviews (80% of those intercepted).

To check for possible bias in the interview study, we compared separate demographic characteristics available for both visitors who completed interviews and visitors who refused for any reason (from observations). These include, residence, age, gender, and racial/ethnic identification, and interview location.

There were no significant differences between individuals interviewed upon entering the exhibition and those exiting.

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[8] General interviewing instructions were based on Institutional Studies, *A Manual for Interviewers.* Prepared for the 1988 National Air and Space Survey. Report 88-3. (Washington, D. C.: Smithsonian Institution, 1988). The general instructions and question-by-question specifications for this study are available from the Institutional Studies office.

[9] The schedule is on file, ISO.

# Observations of Summer Visitors in
## *The Janet Annenberg Hooker Hall of Geology, Gems, and Minerals*
### Complete Report

## Introduction

As part of the larger study of *The Janet Annenberg Hooker Hall of Geology, Gems, and Minerals* at NMNH, visitors were unobtrusively observed. Visitors were selected for tracking at the entrance to the exhibition space and their stops (locations and duration) were recorded from that point until they left the exhibition. A "stop" was recorded if it was at least three seconds in duration. In addition to behavior, a few demographic characteristics were recorded from observations.

A detailed map was used for the Tracking Study (see section IX of this report). A total of 244 exhibition elements were included in the observation protocol. An element was any distinct museum artifact ("real thing"), created artifact (e.g., jewelry fashioned from precious gems and metals), or communication medium, such as a text panel, large photo, video loop, or interactive. The elements and sections of the exhibition were collaboratively identified by the exhibition team and the Institutional Studies Office. The purpose of identifying the locations at which visitors stopped, and the time they spent at various elements, was to collect data that would aid in understanding how and where visitors spent their time in the newly renovated GGM Hall.

## Overall Behavior[8]

The 185 visitors we observed spent an average of 14.8 minutes (*SD*=14.5 minutes) in the exhibition rooms. The median visit was 10.8 minutes; the middle 50 percent of visitors spent between 4.0 and 20.9 minutes. On average, 7.9 minutes (*SD*=9.6 minutes) were spent viewing the exhibition and the remaining time was spent between stops such as speaking with friends, stopping to tie a child's shoe, or sitting on a bench. Surprisingly, different social groupings spent very similar periods of time in the exhibition. As shown in Table VI.1, although visitors who were alone spent slightly less time in the exhibition, there are no significant differences between visit times.[9] The same is true for the total time stopped. Overall about one-half of the time in the exhibition was spent engaged with exhibition elements. Social groups that included children spent the least amount of time engaged and groups of adults spent the most. Some of these groups are quite small, so differences should be viewed with caution.

Visitors made an average of 12.9 stops (*SD*=12.34 stops) during their visit. The median number of stops was 10.0; the middle 50 percent of visitors made between 2 and 21 stops. Groups of adults tended to make more stops than those with children or than individuals visiting alone.

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[8] The terms used in this section are defined on page 21.

[9] All the tables for this section may be found in section VI. of this report. Tracking maps may be found in section X.

Movement through the exhibit was not always linear. About one-third (63 or 34.1%) of visitors returned to see a particular exhibition element more than once. Return stops were most common in the Minerals & Gems Gallery (see Table VI.1). Without the 'return' stops, the 185 visitors made a total of 2,548 unique stops.

As is apparent from the data on the average number of stops and the total stopped time, the average stop time at a specific element was just under one minute, (0.7 minutes, $SD=1.1$ minutes). The median was nearly half a minute (0.4 minutes). See Table VI.2.


## Overall Patterns of Gallery Usage

Each gallery in the exhibition held visitors to a different degree. Within the first four galleries (Winston Gallery, National Gem Collection, Minerals & Gems, and Mine), we can identify three major patterns of gallery usage (see Figures V.1 and V.2):

- Visitors who spent less than 10 minutes in the exhibition as a whole spent more time on average stopped in the Winston Gallery than in any other.[10]
- Visitors who spent between 10 minutes and 35 minutes in the exhibition spent more time on average stopped in the National Gem Collection.
- Visitors who spent more than 35 minutes in the exhibition spent more time on average stopped in the Minerals & Gems Gallery.

Except for the one in twelve visitors (8%) who spent 35 minutes or more in the exhibition, all visitors spent an average of about 2 minutes stopped in the Winston Gallery, no matter how long they spent in the exhibition as a whole.

Those who spent more than 25 minutes in the entire exhibition tended to stop much longer in the Plate Tectonics Theater than other visitors. They might have been especially drawn to this location because it offered an opportunity to stop and rest while staying focused on the exhibition.

No matter how long visitors spent in the overall exhibition, they spent relatively little time in the Plate Tectonics Gallery, and the Moon, Meteorites & Solar System Gallery, compared to the other galleries. In fact, the longer visitors spent in the entire exhibition, the smaller the proportion of their stopped time that was spent in the final two galleries. Visitors who took less than five minutes in the exhibition spent over one quarter (29%) of their total stopped time in the last two galleries. Visitors at the other extreme, who took over 35 minutes in the exhibition, spent only 10 percent of their total stopped time in the last two galleries. See Table VI.3.

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[10] There is one exception. Those who spent less than 5 minutes in the exhibition spent on average about as much time in the Meteorites Gallery as in the Winston Gallery. These quick Meteorite Gallery visitors presumably entered the exhibition at the back end.

Figure V.1
Average Time Stopped/Gallery, by Visit Length Type (in Minutes)*



0-5 Min



5-10 Min



10-15 Min



15-20 Min



20-25 Min



25-35 Min



Over 35 Min
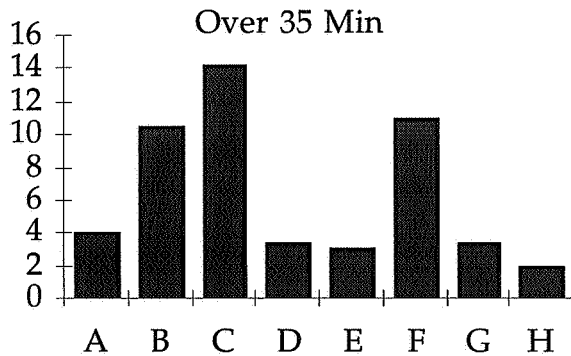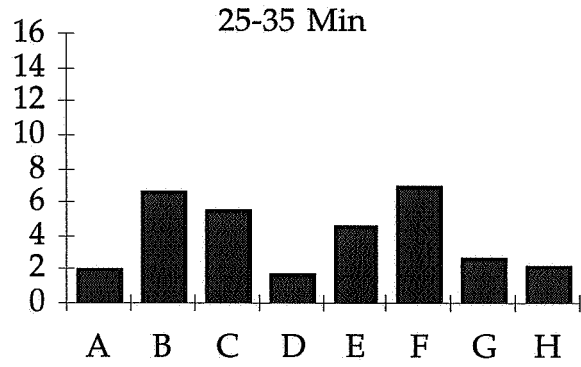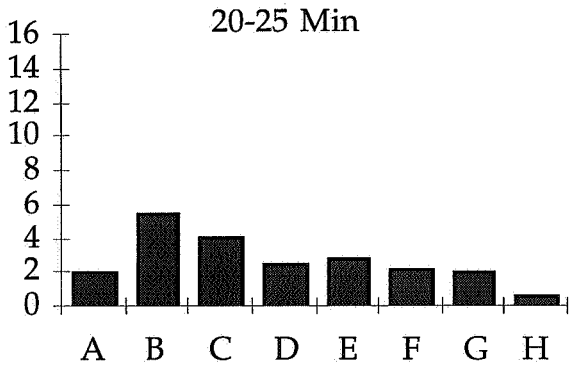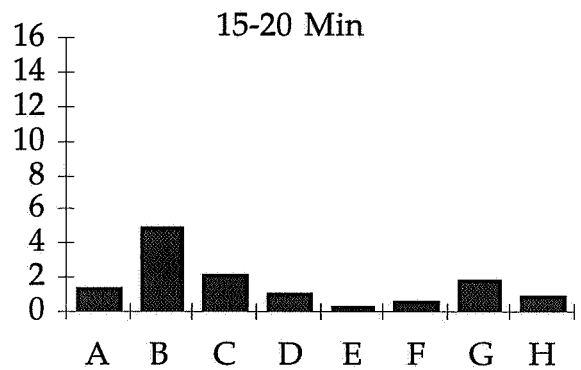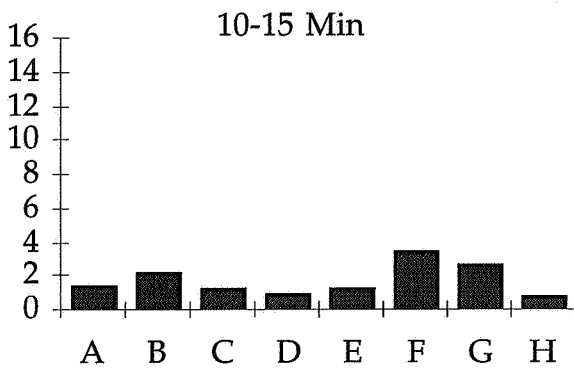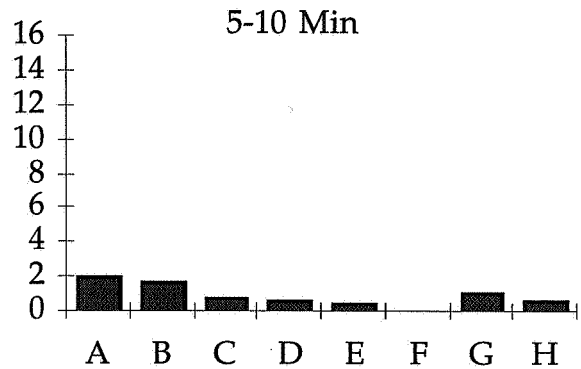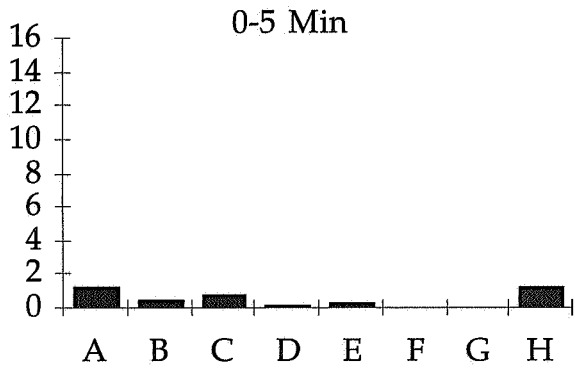
Key
A = Winston Gallery
B = Nat'l Gem Collection
C = Minerals and Gems
D = Mine
E = Rocks Gallery
F = Plate Tectonics Theater
G = Plate Tectonics Gallery
H = Moon, Meteorites & Solar System

* The title of each sub-figure indicates the total Visit Length Type. The vertical axis is the Average Time Stopped.

Figure V.2
Distribution of GGM Visit Lengths
(In Percent)
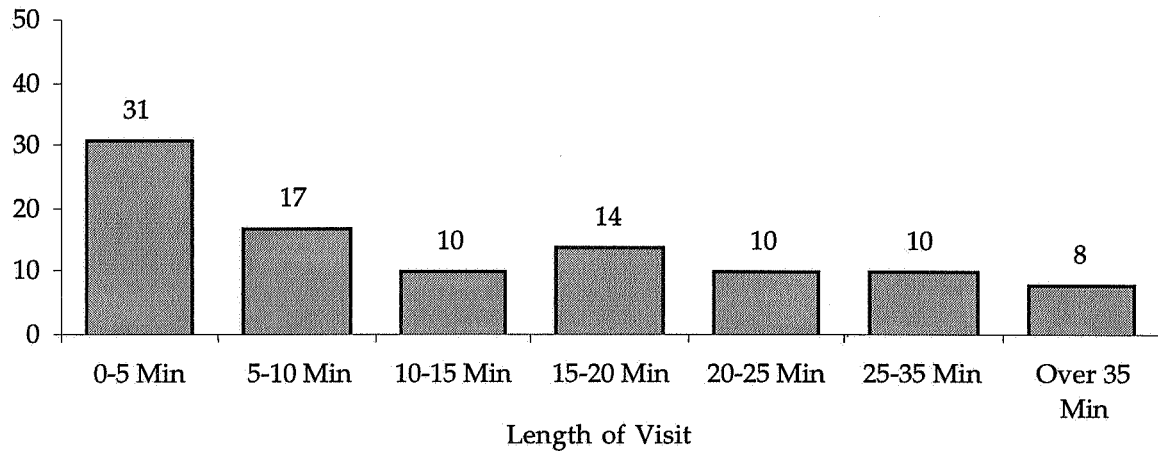


## Exhibition Sections

Different proportions of visitors made <u>at least one stop</u> in each of the galleries:

- 73.5% in the Winston Gallery,
- 67.0% in the National Gem Collection,
- 50.8% in the Minerals & Gems Gallery,
- 34.1% in the Mine Gallery,
- 14.1% in the Rocks Gallery,
- 11.9% in the Plate Tectonics Theater,
- 23.8% in the Plate Tectonics Gallery, and
- 24.9% in the Moon, Meteorites, & Solar System Gallery

Within each gallery, the number of stops also varied.

Upon entering, seven out of ten (73.5%) visitors stopped at one or more of the elements in the first section, the Winston Gallery (see Tables VI.2 and VI.4).[11]  Within this section 31.6% made only one stop while one in twenty (5.6%) made more than five stops.  A total of nearly three in ten made 2, 3, or 4 stops (14.9%, 11.8%, and 4.1% respectively).  Of the visitors who stopped in this section, one fourth (25.0%) only stopped here and then exited.  Most of the rest went on to stop in either the National Gem Collection (26.5%), the Minerals & Gems Gallery (4.9%), or the Mine Gallery (59.8%).  Some visitors (16.1%) made their first stop in the National Gem Collection, some (2.9%) in Minerals & Gems, and four made their first stop in the Mine Gallery or later.

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[11]  Table VI.4 lists, in detail, stops within each of the galleries.  Other presentations of these data (e.g., ordered by rank and element type) are available from ISO upon request.

"Fast Track". We also attempted to determine if the movement through the exhibition, especially the third section (Minerals & Gems), was along a path designated as the "Fast Track" or incorporated stops on one side or the other. The "Fast Track" was defined as a set of stops, primarily in the Minerals & Gems Gallery, but also in the Mine Gallery, the Plate Tectonics Gallery, and the Moon, Meteorites & Solar System section, which would allow visitors to move quickly through the gallery by making stops on islands centrally located in the gallery, without being slowed by stops on the gallery sides. Half (12) of the "Fast Track" stops were in Minerals & Gems so our efforts were concentrated there.

A total of 64 stops were possible in this section (Table VI.2) and of these 12 (18.8%) were on the "Fast Track." Of the 782 stops made in this section, 129 (16.5%) were "Fast Track" stops, a slight underrepresentation, but not a significant difference. Then movement to and from the "Fast Track" stops was examined. While a visitor might make two, or even three successive "Fast Track" stops, these streaks were always interrupted by one or more "Slow Track" stops. No one was found to make purely, or even mostly, "Fast Track" stops. Visitors simply incorporated them into their path through the gallery.

National Gem Collection. Two-thirds (67.0%) of all visitors stopped in the National Gem Collection, making one third (33.1%) of all stops. Locations of the Case/Specimen type were popular, capturing between 19.5% (*Jade*) and 36.8% (*Mineral, Crystal, or Gem? Topaz/Quartz*) of the visitors. Panel locations were all visited by less than 10% of the visitors, *Crystal to Gem* being the most popular (8.6%). Stops in this section very nearly approximated the overall average stop length, 0.64 minutes to 0.66 minutes with a SD of 0.6 minutes. Nearly a third (32.8%) of the visitors who stopped in this section made one or two stops (12.7% and 20.1% respectively), and more than half (53.8%) made more than five. An individual made more stops in this gallery (21) than in any other gallery except Minerals & Gems (34). After visiting this gallery 65 visitors (35.1%) exited the exhibition. These visitors, who only wanted to view the high-recognition, "Icon" items will be discussed in a later section.

Minerals & Gems. The Minerals & Gems Gallery was stopped at by 94 people or 50.8% of the visitors. Five locations in this section were stopped at by more than 15% of the visitors, *Amethyst* (16.8%), *Diversity: Slow Track* (16.8%), *Amazing Gems* (16.2%), *Rio Grande do Sul* (5.7%), and *Look Into a Crystal* (15.1%). A greater percentage of visitors (26.6%) made return stops in this section than in any other, and more stops were possible here than elsewhere. One in ten (10.9%) of the visitors who stopped in this section made only one stop, but more than half 57.7% made more than five stops.

Mine Gallery. One third of the visitors (34.1%) visited the Mine Gallery. The two most popular stops in this section were *Gold* (16.8% of visitors) and *Minerals that Glow* (15.1%). Stops in this section were the shortest, averaging 0.41 minutes (*SD*=0.36) with a median time of 0.30. More than one-fourth (27.2%) made more than five stops in this section, but half (51.5%) made three or less.

Rocks Gallery. The Rocks Gallery, which featured many hands-on specimens of rocks and three computer interactive locations, was unfinished at the time of the tracking study. Nevertheless 14.1% of the visitors made a stop in this section. The five most

popular stops in this section, however, demonstrate the unfinished state of this section. Most visitors to this section looked out a window (6.5%), followed by a video on *Gold/Aluminum* (5.9%), a computer interactive, *Clocks in Rocks* (2.7%), and two benches (2.7% and 2.2%). Undoubtedly, these results are not indicative of visitor behavior in the finished gallery.

Plate Tectonics Theater. Altogether 22 (11.9%) visitors made a stop in the Plate Tectonics Theater. Only one person made a stop at either of the two panels located here. As might be expected, stops made in this section were the longest, averaging 6.55 minutes (*SD*=6.32) and had a median time of 5.72 minutes. The longest stop of all was made here, 22.7 minutes.

Plate Tectonics Gallery. The Plate Tectonics Gallery had 47 possible stops and was visited by 44 people (23.8%) who made 148 stops (5.8%). Of the visitors who stopped in this gallery, nearly one third (32.0%) made one or two stops (16.4% and 15.6%, respectively). More than one in ten (12.3%) made more than 5 stops. In this gallery a video, *Plates Defined* (5.9%), a hands-on interactive, *Volcano Anatomy* (5.4%), and a computer interactive, *Continents on the Move* (4.9%), attracted the most visitors. Volcanoes were the biggest draw in this section, occupying four of the top ten positions, while earthquakes and plate tectonics proper were more evenly distributed.

Moon, Meteorites, & Solar System Gallery. One-fourth (24.9%) of the visitors stopped in the Moon, Meteorites, & Solar System Gallery. They made 107 stops (4.2%), none of which was a return stop. Although a few (5) visitors made their entrance here, for the vast majority this was the last gallery of their visit. Nearly half made only one stop in this section, and three-fourths made three or less. The touchable, *Meteorites*, was stopped at the most (7.0%), followed by the hands-on *Meteor-Rights and Meteor-Wrongs* (4.3%), another touchable, *Sample* (3.8%), a Case/Specimen, *Recognizing Meteorites* (3.8%), and a video, *Target Earth* (3.8%).

## Types of Elements

Although elements of the same type vary in size, complexity, design and function, we can get a sense of how different subgroups respond to different types of elements by looking at the distribution of their stops (Table VI.5). The table suggests, for example, that adults with children examined touchables more than other subgroups. Perhaps the children were more interested in the tactile than adults, and their parents helped them to see what they could learn from these elements. By contrast, adults alone or in groups, ranked lower in stopping at these locations. Women alone, however, were much less likely to stop at the computer interactives or case & panels.

The table also suggests that people visiting the exhibition alone were more inclined to stop at panels, but less interested in taking part in the hands-on stops. We should also note that men with children were most likely than the other subgroups to stop at the computer interactives, while men alone were the most likely to watch a video. Interestingly, women alone were the most likely to stop at the panels, but women with

children were the least likely to do so. Finally, Case/Specimens and Labels seemed to have an equal appeal across all groups.

## Specific Elements/Icon Visitors

Table VI.3 lists all locations at which at least 20% of the visitors stopped. The Hope Diamond stands out high above the rest. This is hardly surprising, as it was seen to be one of NMNH's strongest draws, after dinosaurs.[12] Nearly three-fourths (73%) of the visitors stopped at the Hope Diamond, and 99% of the visitors to the Winston Gallery did so. The remaining 14 locations on this table are all in the National Gem Collection.

In the renovation of the Geology, Gems, and Minerals Hall, the Hope Diamond and the National Gem Collection were moved from deep within the Hall to a location at the entrance, providing visitors who only wanted to view these items with an easy way to look at them and go on their way. As was noted above, more than a third (35.1%) of the visitors were "Icon" visitors, compared to those who moved beyond the first two galleries (General visitors).

There were no significant differences between Icon visitors and General visitors based on demographic characteristics except for age. Visitors who were 40 or older were more likely to be Icon-ers. There were, however, differences in behavior. Icon visitors spent about one-third as much time in the exhibition (5.9 minutes vs. 19.6 minutes) as General visitors. Similarly, they spent about one-third as much time stopped in the exhibition (3.8 minutes vs. 12.1 minutes) as General visitors. General visitors, on the other hand, had a lower percentage of time stopped in the exhibition (48.4% vs. 56.3%) than did Icon visitors. But Icon visitors made only one-fourth as many stops (5.4 vs. 19.3) as the General visitors.

In summary, Icon visitors spent less time in the exhibition, less time stopped, and made fewer stops, as might be expected. They spent a higher percentage of their time stopped in the exhibition, but this may be due to a "fatigue" factor on the part of the General visitors. As the General visitors proceeded through the exhibition, they made fewer stops, and fewer repeat stops, even though their average stop time in the last two galleries was not much shorter than in the first two.

## Final Notes

The last chart, Figure V.3, shows the decrease in the audience as a function of time. This can be visualized by first assuming that all of the visitors we tracked entered at the same time. Thus, before any time has elapsed, the audience is intact (i.e., 100% are present). There is a sharp drop-off until 6 minutes, as a few exit after the Winston Gallery, followed by the Icon visitors. Thereafter the decline is somewhat steady as the

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[12] S. Bielick, A.J. Pekarik, and Z.D. Doering, *Beyond the Elephant: A Report based on the 1994-95 National Museum of Natural History Visitor Study* Report 95-6B. (Washington, D.C.: Smithsonian Institution, 1995)

General visitors make their way through the Hall, gradually dropping off along the way. Between 10 and 12 minutes from entry, half the audience is gone, reflecting the median visit time of 10.8 minutes. After half an hour only 13.5% of the visitors remain, and after 40 minutes all but 3.8% have departed.

## Figure V.3
### Percent of Visitors Remaining in Exhibition by Minutes Elapsed from Entry
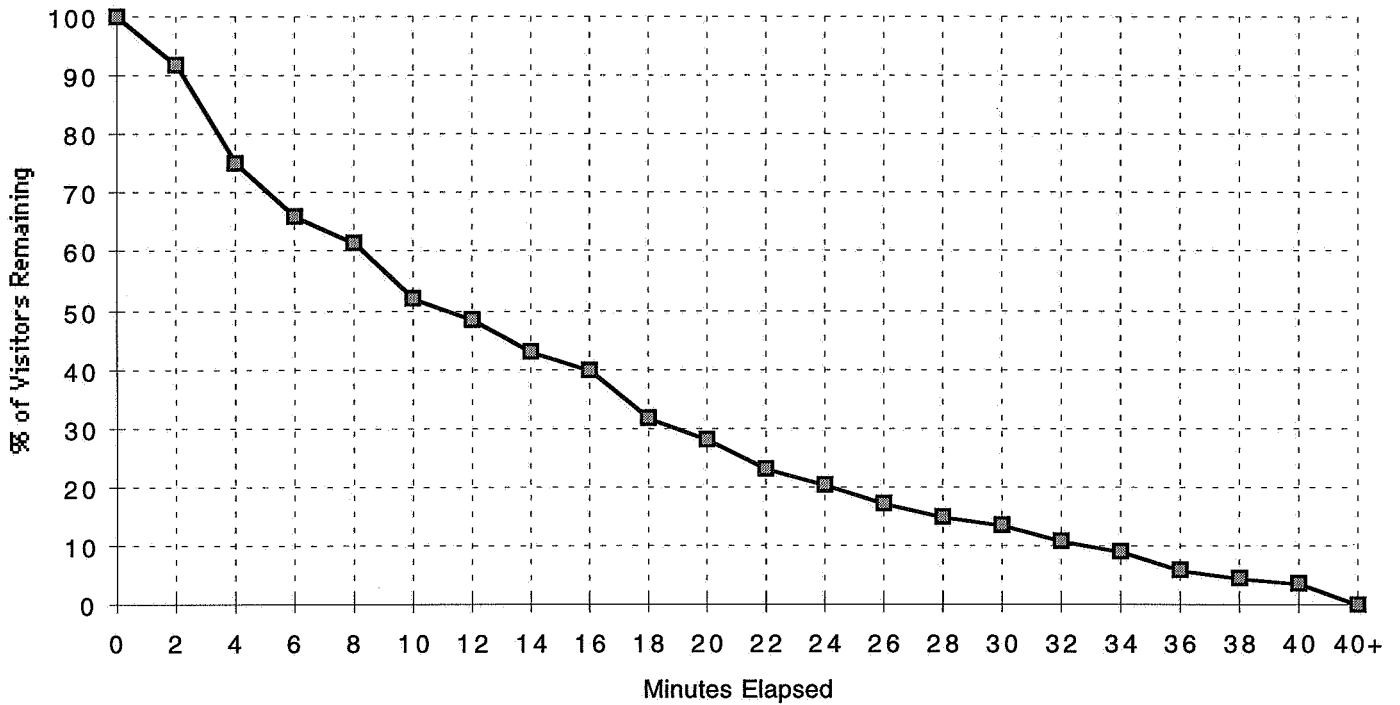
## Definitions

**Visit Time.**
We have defined "visit time" as the total time in the exhibition; i.e., including time observing, time waiting to see an object, and time spent in other activities (e.g., tending to a child).

[The median visit time is 10.8 minutes; i.e., half of the visitors spend more than 10.8 minutes and half less than 10.8 minutes. ]

**Time Stopped.**
In this study, we defined a "stop" as having a minimum duration of 3 seconds in which the visitor is clearly observed looking at an object or engaged in an exhibition related activity (reading text, using an interaction, etc.) "Time Stopped" therefore excludes waiting in line, walking through a gallery, etc. We find that the average stop time = 7.9 minutes (std. dev. = 9.6 minutes).

**Percent Engaged.**
The relationship between "visit time" and "stop time" can be expressed as the percentage of time in the exhibition during which the visitor is directly engaged with the materials that are presented.

**Number of Stops.**
Our observation forms identified a total of 244 possible unique stops in the exhibition. Visitors, however, can return to a specific stop. In this preliminary exploration, we have not excluded 'return stops,' e.g., a visitor who returns to an interactive twice is considered -- at the moment -- to have made three stops. [Using this definition, we find that, on average, visitors make a total of 12.9 stops (std. dev. = 12.34). The median number of stops = 10.]

**Density or "Crowdedness."**
The number of people entering the exhibition during each 15 minutes of interviewing time is used as a basis for defining exhibition density or "crowdedness." For example, consider an individual who was in the hall, headed for the exhibition, and was selected for tracking in a 15 minute period when dozens of people also entered. This person was assumed to experience more crowded conditions than one who entered when only a few others came in. We divided the "visitor flow" distribution into thirds: very crowded, crowded, and not crowded. This allows us to look at our time and behavior measures in terms of density or crowdedness.

# Tables: Observations of Visitors

## Table VI.1
### Behavior in the Geology, Gems and Minerals Exhibition: Subgroups

| | A. Total Time in the Exhibition (Visit Times): Statistics | | | | |
| Sub-groups | No. of Visitors | Avg. Visit Time (Minutes) | Standard Deviation | Median | Maximum | Q3-Q1* |
| --- | --- | --- | --- | --- | --- | --- |
| Male Alone | 11 | 13.3 | 13.6 | 9.1 | 46.6 | 16.7 |
| Female Alone | 16 | 11.7 | 14.8 | 4.6 | 46.8 | 15.7 |
| Male in Adult Group | 41 | 16.1 | 14.2 | 10.4 | 68.4 | 20.9 |
| Female in Adult Group | 40 | 16.9 | 13.9 | 13.9 | 65.9 | 17.8 |
| Male in Adult(s) & Child(ren) Group | 32 | 15.0 | 15.9 | 12.0 | 83.6 | 17.5 |
| Female in Adult(s) & Child(ren) Group | 45 | 12.9 | 9.9 | 11.8 | 37.2 | 12.3 |
| Total | 185 | 14.8 | 14.5 | 10.8 | 83.6 | 16.9 |

| | B. Total Time Observing (Sum of Time at Stops): Statistics | | | | |
| Sub-groups | No. of Visitors | Avg. Stopped Time (Minutes) | Standard Deviation | Median | Maximum | Q3-Q1 |
| --- | --- | --- | --- | --- | --- | --- |
| Male Alone | 10 | 9.6 | 10.1 | 5.3 | 38.3 | 14.5 |
| Female Alone | 15 | 7.8 | 11.9 | 1.4 | 37.9 | 8.9 |
| Male in Adult Group | 39 | 8.9 | 10.4 | 5.3 | 55.0 | 14.8 |
| Female in Adult Group | 37 | 9.6 | 10.1 | 9.0 | 60.7 | 14.4 |
| Male in Adult(s) & Child(ren) Group | 29 | 7.6 | 11.1 | 3.4 | 73.3 | 11.1 |
| Female in Adult(s) & Child(ren) Group | 40 | 5.1 | 5.0 | 3.6 | 22.3 | 6.3 |
| Total | 170 | 7.9 | 9.6 | 4.2 | 73.3 | 11.5 |

| | C. Percent of Visit Time Spent at Stops: Statistics | | | | |
| Sub-groups | No. of Visitors | Avg. % Stopped Time (0.0 - 100.0) | Standard Deviation | Median | Maximum | Q3-Q1 |
| --- | --- | --- | --- | --- | --- | --- |
| Male Alone | 10 | 53.1 | 37.1 | 73.0 | 82.0 | 77.0 |
| Female Alone | 15 | 50.3 | 26.5 | 55.0 | 83.0 | 56.0 |
| Male in Adult Group | 39 | 50.3 | 24.2 | 55.0 | 91.0 | 26.0 |
| Female in Adult Group | 37 | 61.6 | 20.6 | 71.0 | 92.0 | 31.0 |
| Male in Adult(s) & Child(ren) Group | 29 | 41.2 | 28.5 | 48.0 | 88.0 | 42.0 |
| Female in Adult(s) & Child(ren) Group | 40 | 39.3 | 17.9 | 44.5 | 85.0 | 27.0 |
| Total | 170 | 49.0 | 25.2 | 54.5 | 92.0 | 38.0 |

| | D. Number of Stops: Statistics | | | | |
| Sub-groups | No. of Visitors | Avg. Number of Stops | Standard Deviation | Median | Maximum | Q3-Q1 |
| --- | --- | --- | --- | --- | --- | --- |
| Male Alone | 11 | 11.0 | 11.3 | 7.0 | 40.0 | 20.0 |
| Female Alone | 16 | 9.5 | 9.8 | 3.5 | 38.0 | 13.5 |
| Male in Adult Group | 41 | 15.7 | 14.5 | 12.0 | 61.0 | 24.0 |
| Female in Adult Group | 40 | 13.3 | 11.8 | 15.0 | 50.0 | 17.5 |
| Male in Adult(s) & Child(ren) Group | 32 | 12.9 | 14.2 | 9.5 | 75.0 | 16.0 |
| Female in Adult(s) & Child(ren) Group | 45 | 11.3 | 10.1 | 8.0 | 42.0 | 15.0 |
| Total | 185 | 12.9 | 12.3 | 10.0 | 75.0 | 19.0 |

* The number that fall between the 25th and 75th percentiles.

(cont. )

## Table VI.1 (cont.)
## Behavior in the Geology, Gems and Minerals Exhibition: Subgroups

| | E. Stop Time : Statistics | | | | |
| Sub-groups | Unique Stops | Avg. Stop Time (Minutes) | Standard Deviation | Median | Maximum |
|---|---|---|---|---|---|
| **Alone (Total)** | 270 | 0.9 | 1.8 | 0.5 | 20.9 |
| Male Alone | 127 | 0.8 | 1.5 | 0.5 | 14.4 |
| Female Alone | 143 | 0.9 | 2.1 | 0.5 | 20.9 |
| **Group (Total)** | 1291 | 0.7 | 1.0 | 0.4 | 22.7 |
| Male in Adult Group | 675 | 0.6 | 0.8 | 0.4 | 9.1 |
| Female in Adult Group | 616 | 0.7 | 1.2 | 0.5 | 22.7 |
| **Adults & Children (Total)** | 987 | 0.6 | 1.0 | 0.4 | 20.0 |
| Male in Adult(s) & Child(ren) Group* | 458 | 0.6 | 1.2 | 0.4 | 20.0 |
| Female in Adult(s) & Child(ren) Group* | 529 | 0.6 | 0.8 | 0.3 | 9.2 |
| **Total** | 2548 | 0.7 | 1.1 | 0.4 | 22.7 |

| | F. Stop Time : Statistics | | | | |
| Characteristics | Unique Stops | Avg. Stop Time (Minutes) | Standard Deviation | Median | Maximum |
|---|---|---|---|---|---|
| **Age** | | | | | |
| 19 and Younger | 565 | 0.6 | 1.1 | 0.3 | 20.0 |
| 20-29 | 354 | 0.7 | 0.9 | 0.4 | 9.2 |
| 30-39 | 571 | 0.6 | 0.8 | 0.4 | 8.7 |
| 40-49 | 438 | 0.7 | 1.3 | 0.4 | 22.7 |
| 50 and Older | 620 | 0.8 | 1.3 | 0.5 | 20.9 |
| | | | | | |
| **Type of Element** | | | | | |
| Unnamed | 54 | 1.2 | 3.0 | 0.4 | 20.9 |
| Case & Panel | 52 | 0.3 | 0.2 | 0.2 | 1.1 |
| Case/Specimen | 1879 | 0.6 | 0.6 | 0.4 | 6.3 |
| Computer Interactive | 74 | 0.9 | 1.0 | 0.6 | 4.5 |
| Hands-On | 29 | 0.9 | 1.4 | 0.6 | 7.2 |
| Label | 39 | 0.3 | 0.3 | 0.3 | 1.5 |
| Panel | 242 | 0.5 | 0.7 | 0.3 | 4.0 |
| Touchable | 104 | 0.3 | 0.2 | 0.3 | 1.3 |
| Video | 75 | 2.8 | 4.5 | 0.6 | 22.7 |
| | | | | | |
| All Stops | 2548 | 0.7 | 1.1 | 0.4 | 22.7 |

*Observed individual in a group of Adult(s) & Child(ren)

## Table VI.2
## Percent of Visitors who Stopped in Each Exhibition Area

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Exhibition Area | Number of Visitors | Percent of Visitors Who Stopped | Number Making Repeat Stops in Area | Percent of Repeats in Area | Number of Possible Stops in Area |
| Winston Gallery | 136 | 73.5 | 20 | 14.7 | 24 |
| National Gem Collection | 124 | 67.0 | 22 | 17.7 | 21 |
| Minerals & Gems Gallery | 94 | 50.8 | 25 | 26.6 | 64 |
| Mine Gallery | 63 | 34.1 | 6 | 9.5 | 32 |
| Rocks Gallery | 26 | 14.1 | 1 | 3.8 | 8 |
| Plate Tectonics Theater | 22 | 11.9 | 0 | 0.0 | 3 |
| Plate Tectonics Gallery | 44 | 23.8 | 4 | 9.1 | 47 |
| Moon, Meteorites & Solar System Gallery | 46 | 24.9 | 0 | 0.0 | 45 |

## Table VI.3
## Average Time Stopped/Gallery by Visit Length Type (in Minutes)

| | Visit Length Type* | | | | | | |
|---|---|---|---|---|---|---|---|
| Gallery | 0-5 | 5-10 Min | 10-15 Min | 15-20 Min | 20-25 Min | 25-35 Min | Over 35 Min |
| A - Winston | 1.3** | 2.0 | 1.3 | 1.4 | 2.0 | 2.0 | 4.0 |
| B - Nat'l Gem | 0.5 | 1.7 | 2.1 | 5.0 | 5.5 | 6.6 | 10.5 |
| C - Min. & Gem | 0.7 | 0.8 | 1.3 | 2.2 | 4.1 | 5.5 | 14.2 |
| D - Mine | 0.2 | 0.7 | 1.0 | 1.0 | 2.5 | 1.7 | 3.4 |
| E - Rocks | 0.3 | 0.4 | 1.3 | 0.3 | 2.8 | 4.6 | 3.0 |
| F - PT Theater | 0.0 | 0.0 | 3.4 | 0.6 | 2.2 | 6.9 | 10.9 |
| G - PT Gallery | 0.0 | 1.1 | 2.6 | 1.8 | 2.0 | 2.7 | 3.4 |
| H - Moon, M & SS | 1.2 | 0.7 | 0.7 | 0.9 | 0.6 | 2.2 | 1.9 |
| Total | 4.2 | 7.4 | 13.8 | 13.2 | 21.8 | 32.2 | 51.3 |
| A+B+C+D | 2.7 | 5.2 | 5.7 | 9.7 | 14.1 | 15.8 | 32.1 |
| E+F | 0.3 | 0.4 | 4.7 | 0.8 | 5.0 | 11.5 | 14.0 |
| G+H | 1.2 | 1.8 | 3.3 | 2.7 | 2.6 | 4.9 | 5.2 |
| % A-D | 64.5*** | 70.2 | 41.7 | 73.2 | 64.9 | 49.1 | 62.5 |
| % E-F | 6.4 | 5.7 | 34.2 | 6.2 | 23.1 | 35.7 | 27.3 |
| % G-H | 29.1 | 24.1 | 24.1 | 20.6 | 12.0 | 15.2 | 10.2 |

*Total time from entry to exit in GGM.

**Cell entries are the average time visitors stopped in a specific gallery.

***Entries are the percent of stopped time spent in several galleries.

Table VI.4
## Stops in the Geology, Gems and Minerals Exhibition: Spatial Order

| Location | Type | Description | Percent Who Stopped at Each Exhibit | Unique Stops: Statistics | | |
| | | | | Average Stop Time (Minutes) | Standard Deviation | Median |
|---|---|---|---|---|---|---|
| **Gallery A** | | **Winston Gallery** | **73.5** | **0.76** | **0.71** | **0.53** |
| A01 | Case/Specimen | Hope Diamond | 73.0 | 1.08 | 0.57 | 0.95 |
| A02 | Panel | Hope Diamond Social History | 10.8 | 1.64 | 1.34 | 1.30 |
| A03 | Panel | Hope Diamond Geological History | 9.7 | 1.08 | 0.89 | 0.87 |
| A04 | Case/Specimen | Copper | 5.9 | 0.33 | 0.17 | 0.25 |
| A06 | Panel | Copper Panel B | 2.2 | 0.44 | 0.20 | 0.50 |
| A07 | Label | Copper Label | 5.4 | 0.30 | 0.11 | 0.28 |
| A08 | Case/Specimen | Quartz | 5.4 | 0.29 | 0.09 | 0.29 |
| A09 | Panel | Quartz Panel A | 2.2 | 0.34 | 0.25 | 0.28 |
| A10 | Panel | Quartz Panel B | 1.1 | 0.25 | 0.14 | 0.25 |
| A11 | Label | Quartz Label | 8.6 | 0.36 | 0.34 | 0.27 |
| A12 | Case/Specimen | Meteorite | 8.1 | 0.44 | 0.27 | 0.35 |
| A13 | Panel | Meteorite Panel A | 2.2 | 0.32 | 0.11 | 0.29 |
| A14 | Panel | Meteorite Panel B | 1.6 | 0.52 | 0.19 | 0.42 |
| A15 | Label | Meteorite Label | 4.3 | 0.32 | 0.26 | 0.23 |
| A16 | Case/Specimen | Sand | 10.8 | 0.25 | 0.17 | 0.20 |
| A17 | Panel | Sand Panel A | 2.2 | 0.17 | 0.06 | 0.18 |
| A18 | Panel | Sand Panel B | 6.5 | 0.25 | 0.27 | 0.17 |
| A19 | Label | Sand Label | 1.6 | 0.21 | 0.13 | 0.18 |
| A20 | Case/Specimen | Granite | 4.3 | 0.23 | 0.09 | 0.19 |
| A21 | Panel | Granite Panel A | 1.1 | 0.31 | 0.01 | 0.31 |
| A22 | Panel | Granite Panel B | 2.2 | 0.30 | 0.17 | 0.32 |
| A23 | Label | Granite Label | 1.1 | 0.18 | 0.04 | 0.18 |
| A24 | Panel | Hope Diamond (center) | 4.9 | 0.29 | 0.27 | 0.20 |

(cont.)

**Exhibition = 185 Visitors**

Table VI.4 (cont.)
## Stops in the Geology, Gems and Minerals Exhibition: Spatial Order

| | | | | Unique Stops: Statistics | | |
|---|---|---|---|---|---|---|
| Location | Type | Description | Percent Who Stopped at Each Exhibit | Average Stop Time (Minutes) | Standard Deviation | Median |
| **Gallery B** | | **National Gem Collection** | **67.0** | **0.64** | **0.60** | **0.47** |
| B01 | Panel | Treasures from the Natl Gem Coll.-A | 7.0 | 0.29 | 0.17 | 0.22 |
| B02 | Case/Specimen | Necklace/Bracelet | 35.1 | 0.45 | 0.36 | 0.32 |
| B03 | Case/Specimen | Mineral, Crystal, or Gem? Topaz/Quartz | 36.8 | 0.55 | 0.41 | 0.42 |
| B04 | Panel | Crystal to Gem | 8.6 | 0.40 | 0.29 | 0.46 |
| B05 | Case/Specimen | Worn by a French Queen/Earrings | 26.5 | 0.67 | 0.54 | 0.55 |
| B06 | Case/Specimen | Gifts from Napoleon/ Necklace, Tiara | 28.6 | 0.66 | 0.39 | 0.60 |
| B07 | Panel | Celebrity Jewels | 5.4 | 0.35 | 0.21 | 0.23 |
| B08 | Case/Specimen | Designed for Spanish Royalty, Necklace | 23.8 | 0.49 | 0.30 | 0.42 |
| B09 | Panel | Gems | 8.1 | 0.54 | 0.39 | 0.37 |
| B10 | Case/Specimen | Rubies & Sapphires | 32.4 | 0.90 | 0.61 | 0.71 |
| B11 | Case/Specimen | Stars & Cat's Eyes | 23.2 | 0.53 | 0.29 | 0.52 |
| B12 | Case/Specimen | Jade | 19.5 | 0.53 | 0.32 | 0.49 |
| B13 | Case/Specimen | A Royal Legacy/Emerald Ring | 22.7 | 0.52 | 0.40 | 0.46 |
| B14 | Case/Specimen | Emeralds & Aquamarines | 29.7 | 1.09 | 0.86 | 0.80 |
| B15 | Panel | Diamonds-A | 7.0 | 0.33 | 0.23 | 0.25 |
| B16 | Case/Specimen | Diamonds-B | 32.4 | 1.37 | 1.19 | 0.88 |
| B17 | Case/Specimen | Diamonds Natural & Cut | 21.6 | 0.48 | 0.33 | 0.38 |
| B18 | Case/Specimen | Quartz Crystal Ball | 31.4 | 0.47 | 0.30 | 0.38 |
| B19 | Panel | Treasures from the Natl Gem Coll-B | 2.2 | 0.30 | 0.14 | 0.29 |
| B20 | Case/Specimen | Pearl Necklace/Quartz Egg | 23.2 | 0.44 | 0.49 | 0.32 |
| B21 | Case/Specimen | Hooker Jewels | 30.3 | 0.52 | 0.36 | 0.48 |

(cont.)

Table VI.4 (cont.)
<u>Stops in the Geology, Gems and Minerals Exhibition: Spatial Order</u>

| | | | Percent Who Stopped at Each Exhibit | Unique Stops: Statistics | | |
| --- | --- | --- | --- | --- | --- | --- |
| Location | Type | Description | | Average Stop Time (Minutes) | Standard Deviation | Median |
| **Gallery C** | | **Minerals & Gems Gallery** | | | | |
| C01 | Panel | Minerals and Gems Gallery | 0.5 | 0.35 | . | 0.35 |
| C02 | Panel | Quartz-A | 1.6 | 0.33 | 0.07 | 0.35 |
| C03 | Touchable | Touch Some Atoms/Quartz | 9.2 | 0.30 | 0.12 | 0.28 |
| C04 | Case/Specimen | Salt of the Earth | 2.7 | 0.49 | 0.30 | 0.65 |
| C05 | Case/Specimen | Look into a Crystal | 15.1 | 0.47 | 0.35 | 0.38 |
| C06 | Touchable | Amethyst | 16.8 | 0.35 | 0.29 | 0.25 |
| C07 | Panel | Collection Built on Gifts | 2.7 | 0.64 | 0.58 | 0.38 |
| C08 | Computer Interactive | Crystal Symmetry | 4.9 | 0.54 | 0.37 | 0.55 |
| C09 | Case/Specimen | Shape: The Many Faces of Crystals | 5.9 | 0.68 | 0.60 | 0.45 |
| C10 | Case/Specimen | Shape: What gives crystals their shape | 8.1 | 0.23 | 0.16 | 0.17 |
| C11 | Case/Specimen | SHAPE: Smoky Quartz, Mix, Calcite | 7.6 | 0.48 | 0.43 | 0.31 |
| C12 | Case/Specimen | Shape: One mineral, Many shapes | 14.1 | 0.80 | 0.57 | 0.58 |
| C13 | Case/Specimen | Shape: Pockets of Crystals | 9.2 | 0.28 | 0.14 | 0.27 |
| C14 | Case/Specimen | From India | 14.6 | 0.30 | 0.18 | 0.27 |
| C15 | Case/Specimen | COLOR: 5 cases | 13.5 | 0.49 | 0.34 | 0.35 |
| C16 | Case/Specimen | Color: Mineral Rainbow | 11.4 | 0.39 | 0.31 | 0.30 |
| C17 | Case & Panel | What gives minerals their color? | 7.0 | 0.26 | 0.20 | 0.23 |
| C18 | Case/Specimen | Color: Slow Track | 14.6 | 1.22 | 0.99 | 0.93 |
| C19 | Video | Why are Rubies Red? | 3.2 | 0.41 | 0.25 | 0.31 |
| C20 | Case/Specimen | How many colors? | 8.6 | 0.44 | 0.36 | 0.31 |
| C21 | Case & Panel | How many minerals are there? | 1.6 | 0.64 | 0.49 | 0.68 |
| C22 | Case & Panel | Where are minerals found? | 0.5 | 0.27 | . | 0.27 |
| C23 | Case/Specimen | From Two Elements | 8.6 | 0.30 | 0.17 | 0.23 |
| C24 | Case/Specimen | Arkansas Quartz | 8.6 | 0.35 | 0.15 | 0.30 |
| C25 | Case/Specimen | All One Mineral | 8.1 | 0.39 | 0.30 | 0.23 |
| C26 | Case & Panel | Why are there so many kinds of minerals? | 1.1 | 0.50 | 0.31 | 0.50 |
| C27 | Case & Panel | How are minerals classified? | 2.2 | 0.36 | 0.20 | 0.38 |
| C28 | Case/Specimen | Diversity: One Family, Many Uses | 5.4 | 0.27 | 0.19 | 0.20 |
| C29 | Case/Specimen | Diversity: Study Gallery | 13.5 | 0.86 | 0.72 | 0.72 |
| C30 | Case/Specimen | Diversity: Mineral Bonanza | 7.6 | 0.31 | 0.28 | 0.22 |
| C31 | Case/Specimen | Diversity: Slow Track | 16.8 | 0.99 | 0.94 | 0.70 |
| C32 | Case/Specimen | Amazing Gems: Moon/SunStone, Labradorite | 7.0 | 0.28 | 0.21 | 0.22 |
| C33 | Case & Panel | Are these minerals playing tricks? | 1.6 | 0.18 | 0.13 | 0.12 |

(cont.)

Table VI.4 (cont.)
## Stops in the Geology, Gems and Minerals Exhibition: Spatial Order

| | | | | Unique Stops: Statistics | | |
|---|---|---|---|---|---|---|
| Location | Type | Description | Percent Who Stopped at Each Exhibit | Average Stop Time (Minutes) | Standard Deviation | Median |
| **Gallery C** | | **Minerals & Gems Gallery** | **50.8** | **0.53** | **0.93** | **0.32** |
| C34 | Case/Specimen | Alexandrites | 3.8 | 0.19 | 0.12 | 0.13 |
| C35 | Case/Specimen | Amazing Gems | 16.2 | 0.98 | 0.77 | 0.78 |
| C36 | Panel | Herkimer Diamonds | 1.1 | 0.54 | 0.05 | 0.54 |
| C37 | Case & Panel | A Point at Either End | 0.5 | 0.17 | . | 0.17 |
| C38 | Case/Specimen | Quartz-B | 5.4 | 0.31 | 0.24 | 0.19 |
| C39 | Case/Specimen | Amazing Gems: Wondrous Diversity | 6.5 | 0.82 | 1.76 | 0.23 |
| C40 | Case/Specimen | What's New | 1.1 | 0.23 | 0.06 | 0.23 |
| C41 | Case/Specimen | Rio Grande Do Sul | 15.7 | 0.50 | 0.37 | 0.40 |
| C42 | Case/Specimen | GROWTH: 5 Cases | 9.7 | 0.31 | 0.16 | 0.30 |
| C43 | Case/Specimen | Growth: The Basics | 6.5 | 0.32 | 0.19 | 0.27 |
| C44 | Case & Panel | How do crystals grow? | 2.2 | 0.53 | 0.41 | 0.39 |
| C45 | Case/Specimen | Growth: Slow Track | 14.1 | 0.75 | 0.63 | 0.50 |
| C46 | Case/Specimen | Growth: Different Environments | 5.4 | 0.31 | 0.19 | 0.25 |
| C47 | Case/Specimen | Gypsum Giants | 5.9 | 0.40 | 0.28 | 0.30 |
| C48 | Case/Specimen | Growth: Too Small to See | 7.0 | 0.34 | 0.20 | 0.28 |
| C49 | Case/Specimen | Growth: Crystal Oddities | 7.6 | 0.26 | 0.13 | 0.24 |
| C50 | Case/Specimen | Cave of Swords | 8.1 | 0.32 | 0.28 | 0.22 |
| C51 | Panel | Read a Crystal's Life Story | 1.6 | 0.14 | 0.04 | 0.13 |
| C52 | Case/Specimen | PEGMATITES: 5 Cases | 3.8 | 0.36 | 0.13 | 0.35 |
| C53 | Case/Specimen | Peg: Big Crystals | 2.7 | 0.19 | 0.12 | 0.17 |
| C54 | Case & Panel | What are pegmatites & why special? | 0.5 | 0.40 | . | 0.40 |
| C55 | Touchable | Beryl | 5.9 | 0.35 | 0.22 | 0.32 |
| C56 | Case/Specimen | Pegmatites: Slow Track | 10.8 | 0.68 | 0.64 | 0.48 |
| C57 | Computer Interactive | What do pegmatites look like? | 3.2 | 0.51 | 0.65 | 0.30 |
| C58 | Case/Specimen | Elbaite | 2.7 | 0.50 | 0.36 | 0.47 |
| C59 | Panel | Pockets of Minerals | 2.2 | 0.23 | 0.22 | 0.15 |
| C60 | Case/Specimen | Pegmatite Pocket | 6.5 | 0.28 | 0.15 | 0.27 |
| C61 | Case/Specimen | Elbaites (3 Crystals) | 8.1 | 0.27 | 0.19 | 0.22 |
| C63 | Panel | Mine Gallery | 0.5 | 0.38 | . | 0.38 |
| C64 | Unnamed | Bench | 3.2 | 4.72 | 8.11 | 1.15 |

(cont.)

Table VI.4 (cont.)
## Stops in the Geology, Gems and Minerals Exhibition: Spatial Order

| | | | Percent Who Stopped at Each Exhibit | Unique Stops: Statistics | | |
| | | | | Average Stop Time (Minutes) | Standard Deviation | Median |
| Location | Type | Description | | | | |
|---|---|---|---|---|---|---|
| **Gallery D** | | **Mine** | **34.0** | **0.41** | **0.36** | **0.30** |
| D01 | Case/Specimen | Silver/Copper | 8.1 | 0.38 | 0.27 | 0.35 |
| D02 | Case/Specimen | Gold | 16.8 | 0.64 | 0.42 | 0.50 |
| D03 | Panel | Metals that stand alone | 5.4 | 0.33 | 0.33 | 0.20 |
| D04 | Panel | Mineral, Metal, or Ore? | 0.5 | 0.38 | . | 0.38 |
| D05 | Touchable | Rock | 2.7 | 0.33 | 0.17 | 0.38 |
| D06 | Case & Panel | Pay Dirt | 4.3 | 0.32 | 0.23 | 0.27 |
| D07 | Case/Specimen | Morefield Mine (Right) | 5.4 | 0.37 | 0.31 | 0.23 |
| D08 | Panel | Morefield Mine (Main) | 3.2 | 0.36 | 0.23 | 0.28 |
| D09 | Case/Specimen | Morefield Mine (Left) | 5.9 | 0.29 | 0.25 | 0.17 |
| D10 | Video | Ore to Product | 2.7 | 0.80 | 0.67 | 0.63 |
| D11 | Panel | From Ore to Product | 2.7 | 0.44 | 0.48 | 0.27 |
| D12 | Touchable | Coal | 2.2 | 0.29 | 0.16 | 0.23 |
| D13 | Touchable | Copper Ore | 1.6 | 0.13 | 0.01 | 0.13 |
| D14 | Case/Specimen | Copper Queen Mine | 4.9 | 0.32 | 0.22 | 0.22 |
| D16 | Case/Specimen | Bisbee Cave | 10.8 | 0.36 | 0.22 | 0.34 |
| D17 | Case/Specimen | Minerals from Bisbee | 7.0 | 0.32 | 0.21 | 0.27 |
| D18 | Case/Specimen | Geologist's Treasure Chest | 3.2 | 0.26 | 0.15 | 0.23 |
| D19 | Case/Specimen | Minerals that Glow | 15.1 | 0.41 | 0.30 | 0.35 |
| D21 | Case/Specimen | Sterling Hill Mine | 10.8 | 0.46 | 0.41 | 0.33 |
| D22 | Touchable | Franklinite | 3.2 | 0.18 | 0.04 | 0.20 |
| D23 | Panel | Mores Ores (Center) | 1.1 | 0.14 | 0.02 | 0.14 |
| D24 | Panel | Mores Ores (Outer) | 4.3 | 0.29 | 0.23 | 0.24 |
| D25 | Computer Interactive | Mining a Car | 3.8 | 0.51 | 0.43 | 0.28 |
| D27 | Case/Specimen | Ore Treasures | 5.9 | 0.45 | 0.64 | 0.30 |
| D28 | Panel | What's that Sound | 2.2 | 0.30 | 0.10 | 0.29 |
| D29 | Case/Specimen | Fletcher Mine | 9.2 | 0.37 | 0.23 | 0.33 |
| D30 | Panel | Fletcher Mine (Main) | 1.1 | 1.25 | 1.56 | 1.25 |
| D31 | Case/Specimen | Saved from the Crusher | 4.9 | 0.35 | 0.22 | 0.32 |
| D32 | Panel | Main panel near pipe | 1.1 | 0.37 | 0.02 | 0.37 |

(cont.)

Table VI.4 (cont.)
## Stops in the Geology, Gems and Minerals Exhibition: Spatial Order

| Location | Type | Description | Percent Who Stopped at Each Exhibit | Unique Stops: Statistics Average Stop Time (Minutes) | Standard Deviation | Median |
|---|---|---|---|---|---|---|
| **Gallery E** | | **Rocks** | **14.1** | **1.58** | **2.02** | **0.67** |
| E01 | Computer Interactive | Stories in Rocks | 0.5 | 0.28 | . | 0.28 |
| E02 | Computer Interactive | Clocks in Rocks | 2.7 | 0.89 | 0.57 | 0.80 |
| E03 | Computer Interactive | How Rocks Deform/Melt | 1.6 | 1.08 | 0.67 | 1.32 |
| E04 | Video | Gold/Aluminum | 5.9 | 2.45 | 2.79 | 0.80 |
| E05 | Unnamed | Window | 6.5 | 0.90 | 1.54 | 0.28 |
| E06 | Hands-On | Rocks Carts | 1.1 | 3.80 | 4.78 | 3.80 |
| E07 | Unnamed | Bench - Video | 2.2 | 0.64 | 0.68 | 0.35 |
| E08 | Unnamed | Bench - Window | 2.7 | 2.41 | 1.11 | 2.12 |
| | | | | | | |
| **Gallery F** | | **Plate Tectonics Theater** | **11.9** | **6.55** | **6.32** | **5.72** |
| F01 | Panel | Sandstone | 0.5 | 0.55 | . | 0.55 |
| F02 | Panel | Plate Tectonics-A | 0.5 | 0.37 | . | 0.37 |
| F03 | Video | Plate Tectonics-B | 11.4 | 7.13 | 6.32 | 7.72 |
| | | | | | | |
| **Gallery G** | | **Plate Tectonics** | **23.8** | **0.71** | **0.82** | **0.43** |
| G01 | Panel | Geological Revolution | 0.5 | 0.22 | . | 0.22 |
| G02 | Panel | Continents Adrift | 0.5 | 0.15 | . | 0.15 |
| G03 | Case & Panel | Secrets from the sea floor | 2.2 | 0.20 | 0.09 | 0.19 |
| G04 | Panel | The View Today | 1.1 | 0.78 | 0.42 | 0.78 |
| G05 | Panel | Volcanoes! | 1.1 | 0.27 | 0.07 | 0.27 |
| G06 | Hands-On | Volcano Anatomy | 5.4 | 0.86 | 1.10 | 0.54 |
| G07 | Computer Interactive | Design a Volcano | 2.2 | 1.39 | 1.69 | 0.63 |
| G08 | Case/Specimen | Volcano Profiles Specimens | 3.8 | 0.45 | 0.37 | 0.36 |
| G09 | Computer Interactive | Volcano Study Station | 3.8 | 1.95 | 1.53 | 1.38 |
| G10 | Panel | Plate Tectonics Main Panel | 0.5 | 0.32 | . | 0.32 |
| G11 | Case/Specimen | Spreading Ridges (right) | 0.5 | 0.20 | . | 0.20 |
| G12 | Case/Specimen | Spreading Ridges (left) | 0.5 | 0.48 | . | 0.48 |
| G13 | Computer Interactive | Spreading Ridges | 3.2 | 0.65 | 0.72 | 0.44 |
| G15 | Case/Specimen | Continental Hot Spots | 0.5 | 0.43 | . | 0.43 |
| G16 | Case/Specimen | Oceanic Hot Spots | 2.2 | 0.57 | 0.62 | 0.31 |
| G17 | Computer Interactive | Hot Spots | 2.2 | 0.65 | 0.77 | 0.37 |
| G18 | Panel | Above Hot Spots | 0.5 | 0.23 | . | 0.23 |
| G19 | Case/Specimen | Globe | 2.7 | 0.34 | 0.28 | 0.18 |
| G20 | Video | Earth like an Apple | 2.7 | 0.29 | 0.15 | 0.25 |
| G21 | Computer Interactive | Continents on the Move | 4.9 | 0.91 | 0.78 | 0.62 |
| G23 | Case/Specimen | Building Continents | 1.1 | 0.29 | 0.23 | 0.29 |

(cont.)

Table VI.4 (cont.)
## Stops in the Geology, Gems and Minerals Exhibition: Spatial Order

| | | | Percent Who Stopped at Each Exhibit | Unique Stops: Statistics | | |
| | | | | Average Stop Time (Minutes) | Standard Deviation | Median |
| Location | Type | Description | | | | |
|---|---|---|---|---|---|---|
| **Gallery G** | | **Plate Tectonics** | | | | |
| G24 | Touchable | Olivine Gabbro | 0.5 | 0.33 | . | 0.33 |
| G25 | Touchable | Oldest Rock | 0.5 | 0.20 | . | 0.20 |
| G27 | Video | Plates Defined | 5.9 | 0.64 | 0.46 | 0.57 |
| G28 | Case/Specimen | Slice of the Fault | 1.1 | 0.74 | 0.62 | 0.74 |
| G29 | Computer Interactive | Explore transform Faults | 2.2 | 0.61 | 0.41 | 0.52 |
| G30 | Case/Specimen | Transform Faults | 4.3 | 0.67 | 0.90 | 0.33 |
| G31 | Hands-On | Three Pigs | 1.6 | 0.42 | 0.24 | 0.42 |
| G34 | Case/Specimen | Explosive Volcanoes | 4.3 | 0.63 | 0.57 | 0.35 |
| G35 | Case/Specimen | Destructive Earthquakes | 2.2 | 0.51 | 0.35 | 0.50 |
| G36 | Computer Interactive | Convergent Margins | 1.6 | 0.71 | 0.82 | 0.30 |
| G39 | Panel | Earthquakes in the News | 0.5 | 0.37 | . | 0.37 |
| G40 | Video | Seismic Waves | 0.5 | 2.32 | . | 2.32 |
| G41 | Hands-On | Make Your Own Earthquake | 3.2 | 0.66 | 0.35 | 0.73 |
| G42 | Computer Interactive | World Earthquake Watch | 2.7 | 1.85 | 1.60 | 1.45 |
| G44 | Case/Specimen | How Did the Layers Form? | 3.2 | 0.28 | 0.15 | 0.28 |
| G45 | Panel | Clues from Meteorites/Rocks | 1.1 | 0.13 | 0.00 | 0.13 |
| G46 | Panel | Clues from Diamonds | 2.2 | 0.70 | 0.41 | 0.79 |
| | | | | | | |
| **Gallery H** | | **Moon, Meteorites, & Solar System Gallery** | **24.9** | **0.51** | **0.55** | **0.33** |
| H03 | Video | Take a Planetary Tour | 2.2 | 0.52 | 0.66 | 0.22 |
| H04 | Case/Specimen | Samples | 1.1 | 0.18 | 0.11 | 0.18 |
| H05 | Touchable | Sample | 3.8 | 0.38 | 0.19 | 0.37 |
| H08 | Case/Specimen | Lunar Rocks | 2.2 | 0.81 | 0.72 | 0.78 |
| H11 | Case/Specimen | Moon/Earth Display | 1.6 | 0.25 | 0.17 | 0.25 |
| H12 | Panel | Impact! | 0.5 | 0.38 | . | 0.38 |
| H13 | Case/Specimen | From Dust to Planets | 3.2 | 0.44 | 0.17 | 0.44 |
| H14 | Computer Interactive | Make an Impact | 0.5 | 2.03 | . | 2.03 |
| H15 | Case/Specimen | Impacts: Evidence on Earth | 0.5 | 1.22 | . | 1.22 |
| H16 | Case/Specimen | Impacts on Other Worlds | 0.5 | 0.58 | . | 0.58 |
| H17 | Case & Panel | Do Meteorites Ever Fall on People? | 1.6 | 0.34 | 0.19 | 0.28 |
| H18 | Touchable | Meteorites | 7.0 | 0.41 | 0.30 | 0.28 |
| H20 | Panel | Where do Meteorites Come From? | 1.1 | 0.41 | 0.41 | 0.41 |

(cont.)

## Table VI.4 (cont.)
## Stops in the Geology, Gems and Minerals Exhibition: Spatial Order

| | | | Percent Who Stopped at Each Exhibit | Unique Stops: Statistics | | |
|---|---|---|---|---|---|---|
| Location | Type | Description | | Average Stop Time (Minutes) | Standard Deviation | Median |
| **Gallery H** | | **Moon, Meteorites, & Solar System Gallery** | | | | |
| H21 | Hands-On | Meteor-Rights and Wrongs | 4.3 | 0.51 | 0.31 | 0.50 |
| H22 | Case/Specimen | Recognizing Meteorites | 3.8 | 0.72 | 0.49 | 0.63 |
| H24 | Panel | Shattered Worlds | 0.5 | 0.17 | . | 0.17 |
| H25 | Case/Specimen | What Killed the Dinosaurs | 1.6 | 0.19 | 0.04 | 0.18 |
| H26 | Video | Target Earth | 3.8 | 1.15 | 0.97 | 0.67 |
| H27 | Case & Panel | Meteorites: Messengers from Outer Space | 0.5 | 0.23 | . | 0.23 |
| H30 | Touchable | Trace a Meteorites Lineage | 2.7 | 0.24 | 0.14 | 0.18 |
| H31 | Case/Specimen | Irons | 1.1 | 0.40 | 0.04 | 0.40 |
| H33 | Case/Specimen | Old Woman | 1.1 | 0.60 | 0.40 | 0.60 |
| H35 | Panel | When Worlds Collide/Antarctica | 2.2 | 0.24 | 0.14 | 0.24 |
| H36 | Panel | Where are Meteorites Found? | 0.5 | 0.07 | . | 0.07 |
| H38 | Case & Panel | Bigger is Better | 2.2 | 0.30 | 0.20 | 0.28 |
| H40 | Video | Birth of the Solar System | 2.2 | 1.15 | 1.55 | 0.41 |
| H41 | Case/Specimen | Ancient Stardust | 2.7 | 0.24 | 0.06 | 0.25 |
| H42 | Case/Specimen | Amazing Allende | 1.6 | 0.29 | 0.13 | 0.25 |
| H44 | Unnamed | Bench - Earth Door | 0.5 | 1.33 | . | 1.33 |
| H45 | Unnamed | Bench Solar System Birth | 0.5 | 0.10 | . | 0.10 |

| | | |
|---|---|---|
| Total Stops, Without Returns | 2548 | |
| Total Visitors Tracked | 185 | |

Table VI.5
Distribution of Unique Stops by Element Type for Subgroups

| | Visitors Alone | | Adult Group | | Adult(s) & Child(ren) Group* | |
|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female |
| Unique Stops (2548) | 127 | 143 | 675 | 616 | 458 | 529 |
| Case & Panel | 1.6 | 0.7 | 2.1 | 2.3 | 2.8 | 1.5 |
| Case/Specimen | 75.6 | 71.3 | 73.8 | 80.0 | 69.0 | 75.4 |
| Computer Interactive | 2.4 | 0.0 | 4.0 | 0.7 | 5.5 | 2.8 |
| Hands-On | 0.0 | 0.7 | 0.7 | 1.0 | 1.3 | 2.1 |
| Label | 1.6 | 2.1 | 1.9 | 1.1 | 1.8 | 1.1 |
| Panel | 11.8 | 16.8 | 10.1 | 9.1 | 10.3 | 6.1 |
| Touchable | 2.4 | 2.1 | 3.3 | 2.6 | 6.1 | 6.1 |
| Unnamed | 0.0 | 2.8 | 0.4 | 1.0 | 1.1 | 2.1 |
| Video | 4.7 | 3.5 | 3.7 | 2.3 | 2.2 | 2.8 |
| | 100.1 | 100.0 | 100.0 | 100.1 | 100.1 | 100.0 |

*Observed Individual in a group of Adult(s) & Child(ren).

| | Number of Elements | Percentage of Elements | Total Stops |
|---|---|---|---|
| Case & Panel | 14 | 5.7 | 52 |
| Case/Specimen | 100 | 41.0 | 1904 |
| Computer Interactive | 15 | 6.1 | 74 |
| Hands-On | 5 | 2.0 | 29 |
| Label | 5 | 2.0 | 39 |
| Panel | 75 | 30.7 | 242 |
| Touchable | 12 | 4.9 | 104 |
| Unnamed | 6 | 2.5 | 29 |
| Video | 12 | 4.9 | 75 |
| | 244 | 100.0 | 2548 |

# A Survey of Summer Visitors Entering and Exiting
## *The Janet Annenberg Hooker Hall of Geology, Gems, and Minerals*
<u>Complete Report</u>

## <u>Introduction</u>

As part of the larger study of the *Geology, Gems, and Minerals* exhibition at NMNH, one-on-one interviews were conducted with visitors entering and exiting the exhibition. Visitors were selected for interview near the entrances to the Moon, Meteorites, and Solar System Gallery and the National Gem Collection. The structured interviews gathered information about visitors' GGM experience and personal background. We thanked participants with exhibition posters.

Over the course of seven days in July 1998, a total of 183 visitors were interviewed entering the exhibition and 131 exiting the exhibition (87% response rate).[13]

## <u>The Visit Context</u>

Visitors come to GGM with different levels of prior experiences at NMNH. This section presents the results for the major questions we asked about prior experiences.

IS TODAY YOUR FIRST VISIT TO THIS MUSEUM?

- Just over half (57%) of visitors were making their first visit to NMNH – 43% were making a repeat visit to the museum.

### Figure VII.1
### <u>First-time and Repeat NMNH Visitors</u>
### (In Percent)



10+ previous visits 10%

4 to 9 previous visits 8%

First visit to NMNH 57%

1 to 3 previous visits 25%

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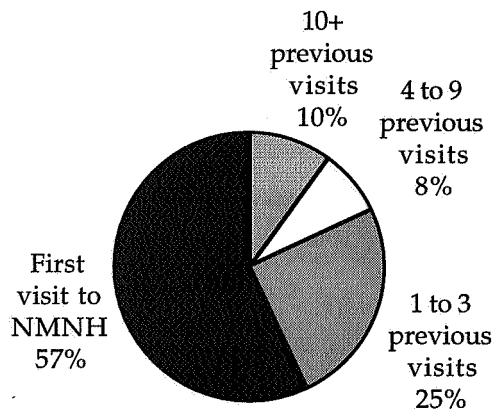
[13] Forty-eight visitors refused to participate due to lack of time or language difficulties.

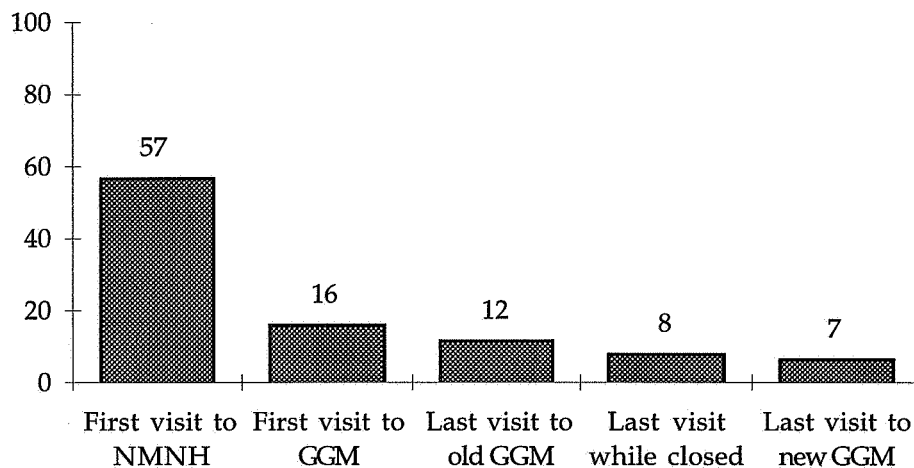- Over half (59%) of the repeat visitors to the museum had visited one to three times before. One out of five (19%) of the repeat visitors to NMNH had visited four to nine times before. Twenty-two percent had made ten or more visits to NMNH.

HAVE YOU VISITED THE GGM EXHIBITION BEFORE TODAY?

- Over half (63%) of repeat museum visitors had visited GGM before the day of the interview. This accounts for 27 percent of all visitors to GGM.

- One quarter (26%) of the repeat visitors to GGM were making a repeat visit to the new installation. Forty-four percent last visited GGM in its previous installation. Nearly one third (30%) of the repeat GGM visitors told us that they last visited GGM between January, 1995 and November, 1997, when the exhibition was closed. Most likely, these visitors saw the Hope Diamond and other select specimens on special display during that period.

- Overall, most visitors to GGM (73%) are making their first visit to the exhibition.

Figure VII.2
First and Repeat Visitors to NMNH and GGM
(In percent)



WAS THERE SOMETHING IN PARTICULAR YOU WANTED TO SEE OR DO IN THIS MUSEUM?

- Seventy-three percent of the visitors interviewed told us that, yes, they did come to the museum with an agenda.

- Over half (53%) of the visitors interviewed told us that Geology, Gems, and Minerals was a part of their visit agenda. Specifically, one-third (38%) came to see the Hope Diamond. Dinosaurs was on the agenda of 31 percent of the

visitors. Twenty-three percent mentioned various other NMNH exhibitions. See Figure VII.3.

Figure VII.3
GGM Visitors' NMNH Agenda
(In Percent)[14]
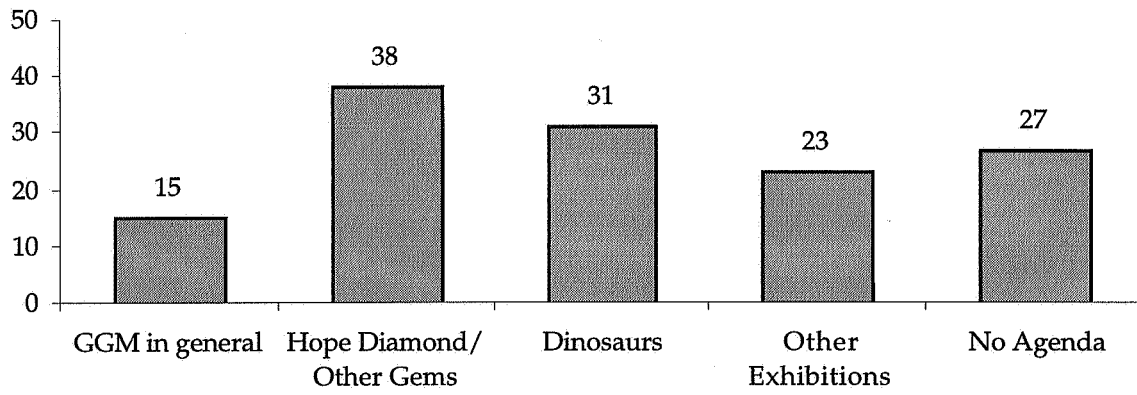


WHAT LED TO YOUR DECISION TO VISIT THE GGM EXHIBITION TODAY?

- Visitors were equally drawn to the exhibition by an interest in geology or gems and a desire to see the Hope Diamond (31% each). Recommendations from friends led 21 percent to visit and 10 percent decided to visit after wandering by.

The Visitors

This section presents the basic demographic characteristics of GGM visitors (residence, race/ethnicity, gender, age, social group, education and occupation). There were no significant differences between visitors to GGM and summer visitors to NMNH.[15]

Residence                The majority (75%) of GGM visitors live in the United States outside of the Washington, DC Metropolitan Area; the rest of the visitors were divided between Metropolitan residency (14%) and foreign residency (11%). See Figure VII.4.

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[14]  Does not add to 100%. Respondents gave more than one agenda for their NMNH visit.
[15]  S. Bielick, A.J. Pekarik, and Z.D. Doering, *Beyond the Elephant: A Report based on the 1994-95 National Museum of Natural History Visitor Study* Report 95-6B. (Washington, D.C.: Smithsonian Institution, 1995)

Figure VII.4
Residence of GGM Visitors, Combined Total
(In percent)

DC Metro
Area
14%

Foreign
11%

Other US
75%
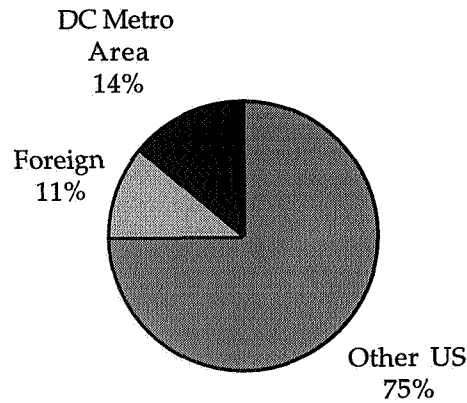
| Race/Ethnicity | Less than one in five (15%) of GGM's U.S. visitors identified themselves with a minority racial/ethnic group. Over four in five (85%) identified themselves as Caucasian/White. |

Asian American visitors were the largest minority group (7%), followed by American Hispanic visitors (5%) and African American visitors (2%).

Gender      Slightly more women (52%) than men (48%) visited GGM during the survey period.

Age      The average age of all GGM visitors is 36 years. See Figure VII.5.

Figure VII.5
Age of GGM Visitors, Combined Total
Age 12 and Over
(In Percent)

| Age | 12–19 | 20-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65+ |
|-----|-------|-------|-------|-------|-------|-------|-----|
| Percent | 18 | 8 | 14 | 28 | 22 | 6 | 5 |
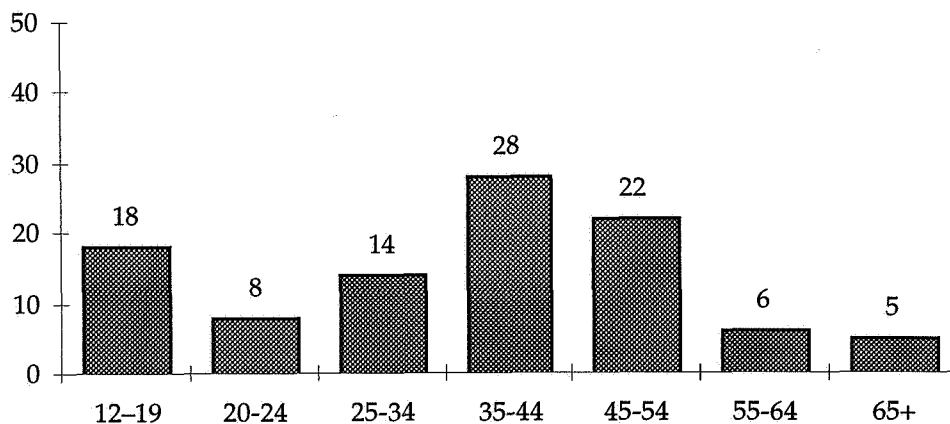
Social Group | Almost half of the visitors (47%) came to GGM in a social group of adults and children. One out of five (21%) visited with one other adult (a pair) and 16 percent visited as part of a group of 3 adults or more. A few visitors came alone (9%) or had separated from their school or tour group (6%).

Education | Over half of GGM adult visitors, age 25 or older, had attained a Bachelor's degree or higher (53%) and 21 percent had earned an Associate's degree or had some college experience.

Occupation | Most visitors (99%) did not engage in a profession related to geology.

Four out of ten (39%) visitors practiced a professional specialty and three out of ten (31%) were not members of the labor force.

## The Visit

This section presents the results from questions asked of exiting visitors about their experience within the exhibition.

Visit Time | Visitors estimated that they spent, on average, 30 minutes inside the exhibition. This is twice the average recorded visit time of visitors observed in the exhibition (15 minutes).[16] The median estimated visit time was 30 minutes, with the shortest estimate being 1 minute and the longest being 120 minutes.[17]

Based on self-reports, visitors, on average, spent nearly an hour in the museum before being interviewed. One third (36%) of visitors said they had been in the museum for less than 30 minutes before entering GGM. Thirteen percent had been in the museum for over two hours before entering GGM. In other words, GGM is a primary destination for the Natural History visitor.

People who had already spent a relatively long time in the building as a whole also spent a relatively long time in GGM. Visit length varied with age; older visitors (45 years and more) spent the most time in GGM while visitors ages 25 to 44 spent the least time.

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[16] See Observations of Visitors in Geology, Gems, and Minerals at the National Museum of Natural History, section II of this report.
[17] S.D. = 24.7 minutes

Paths Taken

Visitors were asked to mark their route through GGM on a schematic of the exhibition. By far, the most popular entrance to the exhibition is through the Winston Gallery; four out of five (80%) visitors reported entering here. Thirteen percent said they entered through the National Gem Collection and eight percent through Moon, Meteorites, and Solar System.

The National Gem Collection was the most visited gallery in the exhibition; nearly all (94%) visitors told us that their visit included this gallery. Slightly fewer (85%) visitors said that they went to the Winston Gallery and three out of four (74%) visitors went to Minerals and Gems. About two-thirds of the visitors went to the Mine (64%), to Plate Tectonics (63%), and to Moon, Meteorites, and Solar System (66%).

Repeat visitors to the exhibition were less likely than first-time visitors to visit Minerals and Gems and the Mine, while first time visitors visited more galleries.

One in five exiting visitors indicated that they had visited only the Winston Gallery and/or the National Gem Collection. We refer to these people as "Icon visitors."

Most Interesting Galleries

People whose visit consisted only of the Winston Gallery and the National Gem Collection ("Icon visitors") were equally likely to choose either of them as the most interesting gallery. Two percent of these declined to indicate a preference .

Of people who visited all six main galleries, one third (31%) chose the National Gem Collection as the most interesting. Three percent chose the Mine as most interesting, while seven percent didn't identify any gallery as most interesting. (Data on file at ISO).

Visitors said that they based their choice for most interesting gallery on the basis of objects displayed (49%), a personal connection (13%), a connection to nature (12%), exhibition elements (9%), or a connection to history (4%) within the gallery.

Least Interesting Galleries

People whose visit consisted only of the Winston Gallery and the National Gem Collection ("Icon visitors") were slightly more likely to choose the National Gem Collection as least interesting (16%). Fifteen percent of these didn't select a "least interesting" gallery.

Of the people who visited all six main galleries, 23 percent chose the Mine as the least interesting. Two percent chose Minerals and

Gems as least interesting, while 23 percent were unable to choose one gallery as least interesting. See Figure VII.6.

Visitors had some difficulty explaining their "least interesting" choices. Among the reasons they mention were having seen these objects previously (9%), liking other galleries more (9%), not liking the exhibition elements (6%), or for personal reasons did not take an interest (12%, lack of time, busy with kids, not on agenda). A few visitors said that a gallery was least interesting because they were not able to understand (3%) or did not like the particular pieces displayed (2%).

Figure VII.6
Galleries Rated Most and Least Interesting by
Visitors to All 6 Galleries
(In percent)
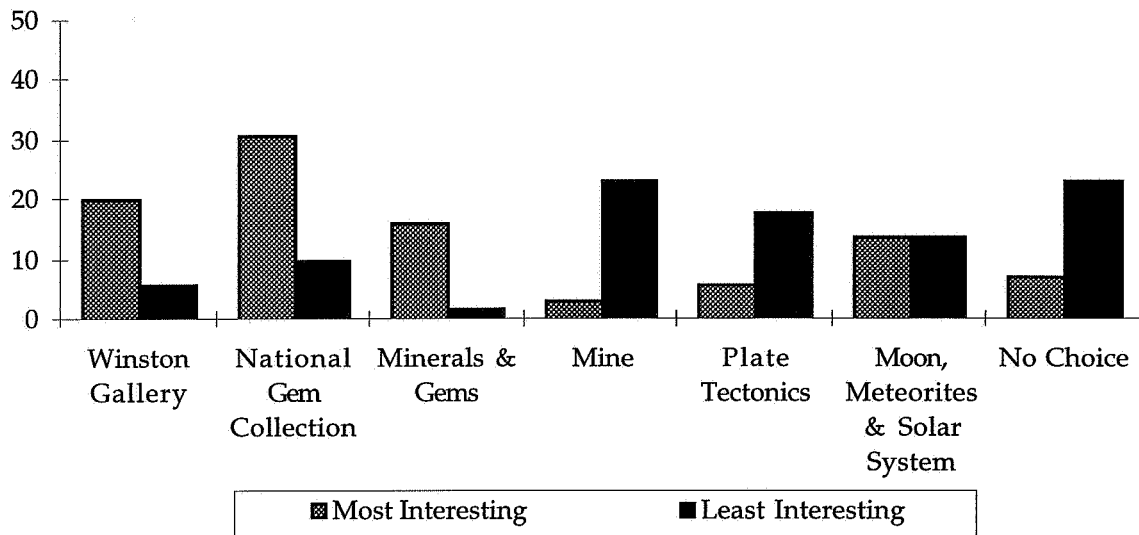


**Crowds**

Summer is a high volume season for Smithsonian museums and we asked visitors if they were affected by crowds. Four out of five (82%) visitors felt that at least one of the galleries was crowded while they were in the exhibition. Sixteen percent of visitors said that the crowds did not affect their visit, but the rest said that the crowds had a negative effect. Visitors negatively affected by crowds reported that they couldn't see as much as they had wanted to, rushed through, or stayed longer than planned. A few said that they left the exhibition altogether, perhaps to return on another day.

Icon visitors overwhelmingly agreed that the National Gem Collection was the most crowded of the two they visited. People visiting all six galleries also felt that the National Gem Collection, of any gallery, was the most crowded.

Figure VII.7
Visitor Perceptions of Gallery Crowding and its Effects
(In percent)



| | |
|---|---|
| Not crowded | 18 |
| Crowded, but no effect | 13 |
| Shortened visit | 19 |
| Couldn't see | 19 |
| General negative effect | 12 |
| Stayed longer | 11 |
| Left exhibition | 8 |
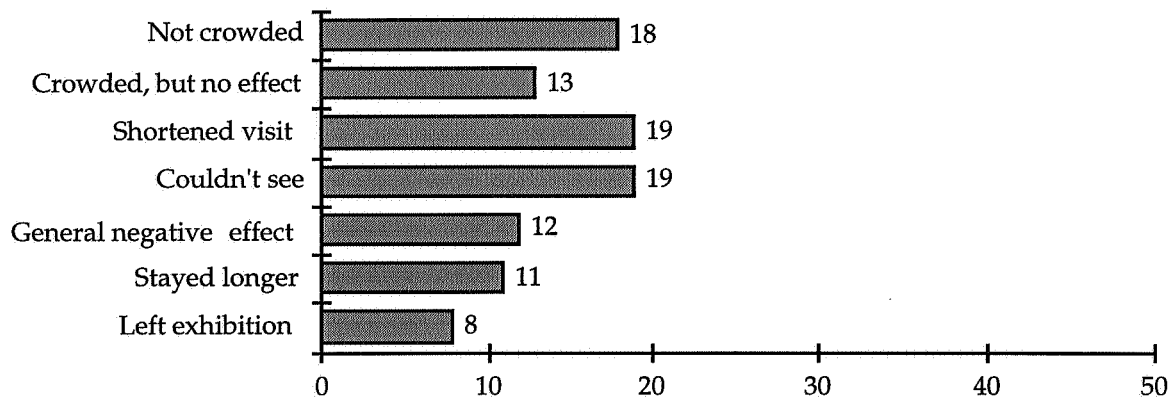
Tiredness

To see how the size and volume of the exhibition affected visitors, we asked them, upon both entry and exit, to rate their level of tiredness at that moment. There were no significant differences between the self-ratings of visitors entering and visitors exiting. Overall, 38 percent rated themselves as not tired, 46 percent rated themselves as somewhat tired, and 15 percent were very tired.

In general, people became more tired as their time in the museum grew longer. There were no significant differences between self-ratings of tiredness and the time they entered the museum, the time of the interview, or the length of their visit to the exhibition.

Reading Text

Over one-third of visitors (37%) said that they decided to read texts when the object was interesting. Other influencing factors were: interesting caption (13%), read everything (12%), aesthetic label (8%), and relationship to personal experience (6%).

Interesting Information

The types of information visitors found most interesting fall into two main categories: qualities intrinsic to the object (scientific/ geological, 58%) and cultural information (social history/ ownership/value, 32%). Ten percent of visitors gave general answers or no answer.

Other Geology Exhibitions

Just less than half (48%) of the visitors exiting GGM reported that they had visited exhibitions about geology, gems and minerals in other museums. They told us that GGM was different from these other exhibitions in its size and the quality and breadth of the collection.

- 40 -

## Exhibition Messages and Educational Objectives

As visitors left the exhibition they were asked, "What did the exhibition as a whole suggest to you personally about the earth?" The responses to this question can be viewed in multiple ways.

First, according to GGM team's gallery-by-gallery outline of major messages, the overall theme of GGM is "the dynamic earth". Unprompted, 15 percent of exiting visitors told us that the exhibition suggested that the earth is dynamic and complex. Though a simpler message, the suggestion that the earth is old (given by 10% of exiting visitors) might also be classified under the theme of the dynamic earth.

Second, the outline of educational objectives for the GGM Hall indicates four goal areas: stewardship, knowledge, appreciation, and scientific thought. Responses to the question about the earth can be classified into the first three of these four categories (see Table VIII.1).

### Figure VII.8
### Exhibition Messages Classified as Educational Objectives
(In Percent)
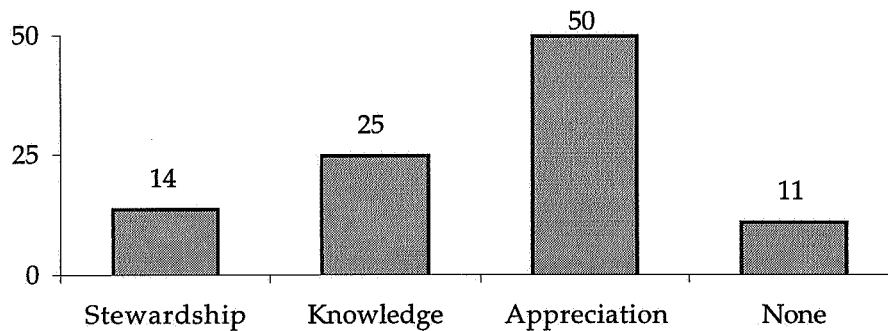


## Stewardship
According to the statement of educational objectives for the exhibition,

> *Our goal is for each visitor to have a sense of stewardship towards the earth - in order to be able to respond in an informed way to environmental and resource issues. We want the visitor to recall how earth processes affect the political, social, and economic choices that people make every day.*

4% of exiting visitors said that the exhibition suggested that the Earth is plentiful and full of variety.

4% of exiting visitors said that the exhibition suggested that we need to conserve the Earth's resources.

6% of exiting visitors said that the exhibition suggested that the Earth holds valuable and rare things within it.

- First time NMNH visitors were more likely than repeat visitors to say that the exhibition suggested messages of stewardship (16% vs. 9%).

- The more time that a visitor spent in the exhibition, the more likely the visitor was to report a stewardship message. One quarter of the visitors who reported that they spent more than 40 minutes in the exhibition gave this suggestion (compared to 5% of those who spent less than 16 minutes and 9% of those who spent between 16 and 40 minutes).

Knowledge

According to the statement of educational objectives for the exhibition,

> *Our goal is for each visitor to understand that the earth is a*
> *dynamic planet - to be able to describe and explain past and*
> *present earth processes in order to be able to anticipate changes in*
> *the earth's products and features. We want the visitor to recall a*
> *story depicted in the exhibit about a past or present earth process,*
> *product, or feature, and to give examples of an earth process that*
> *occurs where the visitor lives.*

15% of exiting visitors said that the exhibition suggested that the Earth is dynamic and complex.

10% of exiting visitors said that the exhibition suggested that the Earth is old.

- Repeat NMNH visitors were more likely than first time visitors to say GGM suggested the dynamism or age of the earth (37% vs. 16%).

- Visitors ages 25 to 44 were more likely to say that the exhibition suggested dynamism or age than either younger or older visitors (38% vs. 5% for those under 25 and 17% for those over 44).

- Visitors spending 1 to 15 minutes in the exhibition were more likely to give this response than those who spent over 15 minutes (43% vs. 16%).

Appreciation

According to the statement of educational objectives for the exhibition,

> *Our goal is for each visitor to develop an aesthetic appreciation of*
> *the earth. We want the visitor to express a greater appreciation of*
> *the beauty of nature and for our place in it, to recognize that rocks,*
> *minerals, and meteorites contain clues about earth processes, and*
> *to realize that many more clues about earth processes contained in*
> *rocks, minerals and meteorites have yet to be uncovered.*

15% of exiting visitors said that the exhibition suggested that the Earth is full of beauty.

13% of exiting visitors said that the exhibition suggested that there is much that we don't know about the Earth and, therefore, much to be learned.

3% of exiting visitors said that the exhibition suggested that the Earth is a very powerful entity and that humans are merely one tile in a great mosaic.

14% of exiting visitors said that the exhibition suggested positive things about the Earth (e.g., it's neat, amazing, fascinating).
5% of exiting visitors said the exhibition had a spiritual message.

- People who reported that they had spent 16 to 40 minutes in GGM were more likely to give one of these appreciation responses (65% vs. 32% of those who spend less than 16 minutes and 46% of those who spent more than 40 minutes).

Scientific Thought
According to the statement of educational objectives for the exhibition,

> *Our goal is for each visitor to be able to understand the nature of scientific inquiry through the use of historical, descriptive, and experimental processes of earth sciences. We want the visitor to realize how scientists working at NMNH and elsewhere study rocks, minerals, and meteorites to better understand earth processes.*

None of the suggestions given by visitors fell under the category of Scientific Thought.

Satisfying Experiences Within GGM

Previous studies have shown that visitors derive a variety of satisfying experiences from museum exhibitions. The distribution of experiences is a function of both the exhibition and the personality of visitors.

Visitors exiting from GGM were asked to select, in order of importance, their three most satisfying experiences in the exhibition from the following list on a card:

- I felt a spiritual connection.
- I spent time with friends/family.
- I saw valuable things.
- I gained knowledge or information.
- I was moved by beauty.
- I imagined other times or places.
- I enriched my understanding.
- I saw my children learning new things.
- I continued my professional development.
- I thought what it would be like to own such things.
- I recalled my travels, childhood experiences, or other memories.
- I saw unusual things.
(For examples, see Table VIII.2.)

Based on all of these choices, the leading experiences, selected by more than one-tenth of the visitors as their most satisfying, were:

- I gained knowledge or information (20%).
- I saw unusual things (17%).
- I saw my children learning new things (16%).
- I was moved by beauty (13%).
(See Table VIII.3)

Since children came with half of the GGM visitors, only half of the visitors could experience seeing their children learning. Thus, we looked at the 'next' most satisfying experience whenever a visitor mentioned "children learning." This adjustment increased the percentages of the other three experiences mentioned above—knowledge or information, unusual things, and beauty (see the second column in Table VIII.3).

Altogether, more than two-fifths of exiting visitors said that gaining information or knowledge was either their most satisfying or second most satisfying experience in the exhibition (41% in the third column of Table VIII.3). More than a quarter said that enriching their understanding (29%) or seeing unusual things (28%) was either their most satisfying or second most satisfying experience in the exhibition.

To facilitate analysis, we excluded "children learning," and then grouped, or clustered, the types of satisfying experiences that were frequently mentioned together by visitors. The technique identified four main experience types. For brevity we have named them Object-Oriented, Cognitive, Interpersonal, and Dreaming.[18]

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[18] In subsequent ISO research, the experience category "Introspective" encompasses the Interpersonal and Dreaming experiences.

Figure VII.9
Satisfying Experiences in GGM



Object-Oriented (38% total)
- I was moved by beauty.
- I saw valuable things.
- I saw unusual things.

Figure VII.9A
Object-Oriented Experiences
(38% of Total)

Figure VII.9B
Cognitive Experiences
(32% of Total)

- Cognitive (32% total)
  I gained knowledge or information.
  I enriched my understanding.



Enriched
Under-
standing
28%

Gained
Knowledge
72%
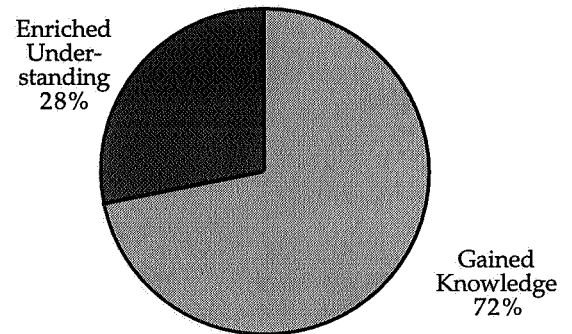
Figure VII.9C
Interpersonal Experiences
(18% of Total)

- Interpersonal (18% total)
  I recalled my travels, childhood
    experiences, or other memories.
  I spent time with friends/family.



Time
with
Family
52%

Recalled
Memories
48%
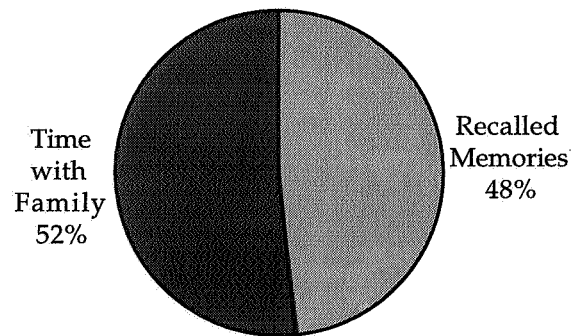
Figure VII.9D
Dreaming Experiences
(11% of Total)

- Dreaming (11% total)
  I thought what it would be like
    to own such things.
  I felt a spiritual connection.
  I imagined other times or places.



Thought
about
Owning
59%

Imagined
other
Times/
Places
41%

Spiritual
Connection
0%
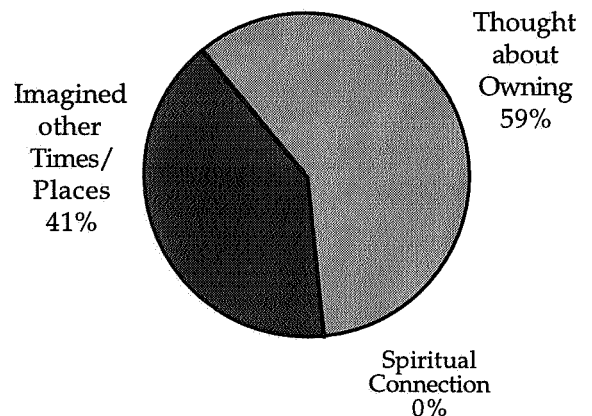
Not surprisingly, more visitors mentioned Object-oriented experiences than those any other type. Two groups stand out as seeing these types of experiences as especially meaningful: visitors with no more than a high school education and local visitors (about 70%).

Cognitive experiences were significantly associated with the age and residence of a respondent. Visitors between the ages of 25 and 34 were more likely (57%) and those under 25 were less likely (18%) to mention a Cognitive experience compared to all respondents (32%). Local visitors mentioned a Cognitive experience less frequently when compared to visitors from other parts of the United States (10% vs. 38%).

Return visitors were more likely to mention Interpersonal experiences than first time visitors.[19] Interpersonal experiences decrease monotonically as the amount of time spent in the exhibition increases[20]. Finally, visitors visiting GGM with children were twice as likely to mention an Interpersonal experience (22%) as other visitors (10%).

Dreaming experiences were selected more frequently by women (17%) than men (3%). Visitors without children and those alone were also more likely to select an experience of this type (18% and 21% respectively).

There are clear associations between reactions to GGM and satisfying experiences. Object-oriented and Dreaming visitors were most likely to identify the National Gem Collection as their most liked gallery. Cognitive visitors were more likely to favor the mine and to designate the National Gem Collection (NGC) as their least liked gallery compared to all visitors (7% compared to 2% for the mine, and 50% compared to 30% for NGC). Interpersonal visitors were also less favorably disposed to NGC compared to all visitors (64% selected NGC as their least liked gallery as compared with 30% for all visitors).

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[19] The percentages are 27% for repeat NMNH visitors and 11% for first time visitors; 29% for repeat GGM visitors and 14% for first time GGM visitors.
[20] 28% for the third who spent least time in the exhibition, 19% for the middle third, and 7% for the third who spent the most time in the exhibition.

Figure VII.10
Percentage of Each Experience Type who
Chose Each Gallery as "Most Interesting"
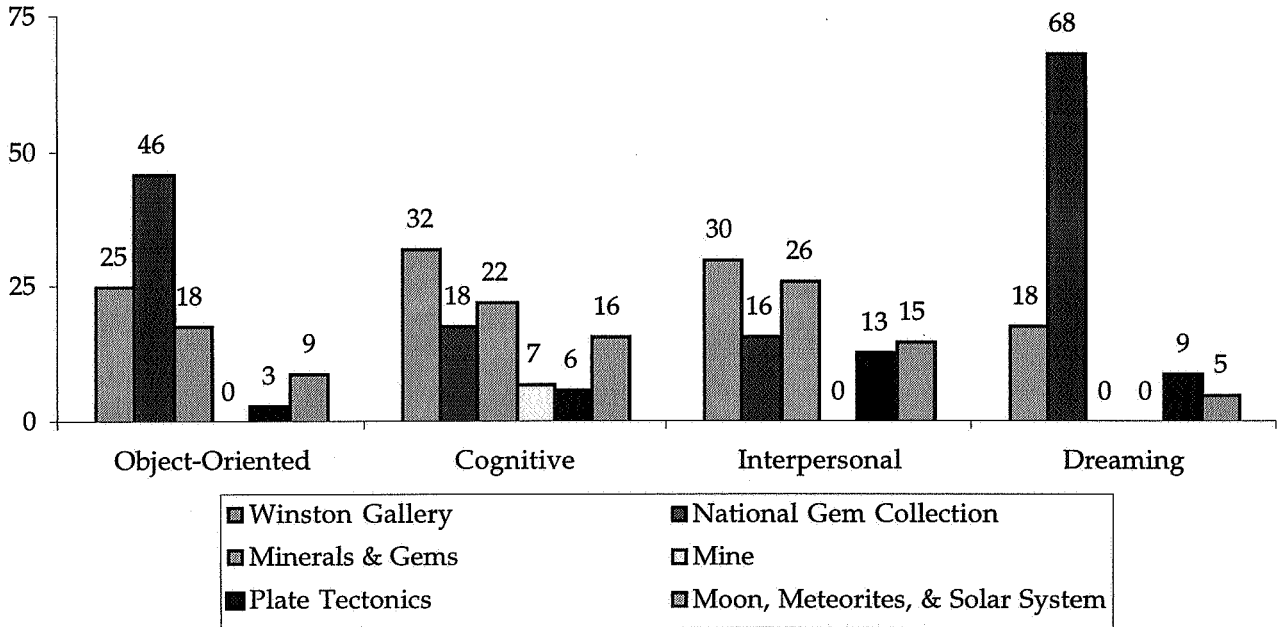


Two of the four experience types were significantly associated with what the exhibition suggested to visitors about the earth. Interpersonal visitors were more likely to express a perception of the exhibition message as "knowledge"-related (52% compared to 25% for all visitors). On the other hand, Dreaming visitors were more likely to perceive an "aesthetic appreciation" related message (51% compared to 14% for all visitors).

Figure VII.11
Messages Perceived by Visitors of Each Experience Type
(In Percent)
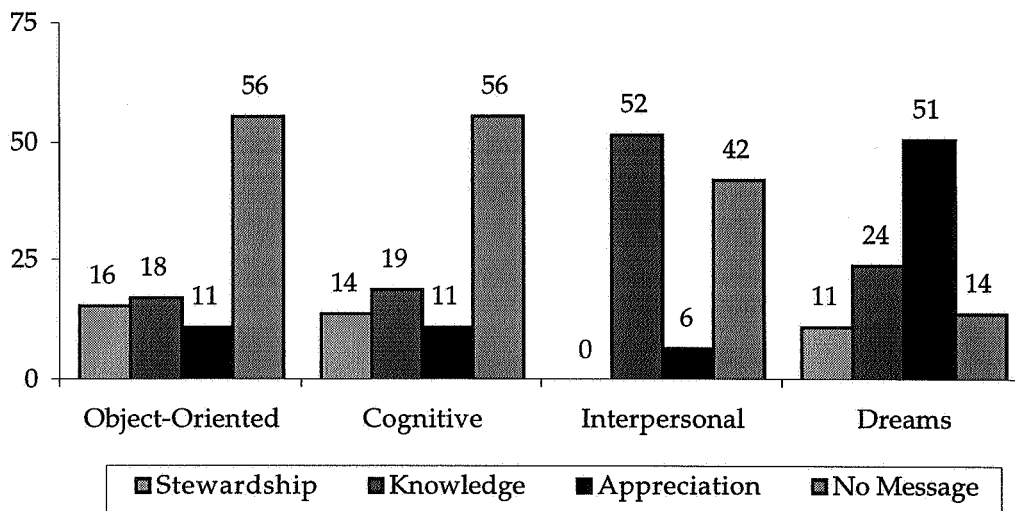
In sum, GGM served a variety of visitors who articulate different types of experiences that they find satisfying. Experiencing the objects and gaining knowledge and understanding were clearly the most satisfying experiences. Differences in satisfying experiences were significantly associated with some demographic variables. Experience differences were also associated with differences in how visitors engaged themselves with the exhibition and their perception of the exhibition's message.

## Supplemental Interviews

### Background

As a supplement to the survey additional interviews were conducted in which visitors were asked to talk about rocks, minerals and gems that they could view outside the exhibition. The purpose of this supplemental study was (a) to identify the vocabulary that visitors used in describing rocks and gems and the processes of their formation, and (b) to determine whether or not there were notable differences in the responses between entering and exiting visitors.

Although gems, minerals and their formative processes were described in the exhibition at the time of the study, the gallery dedicated to rocks had not yet opened. The results of this supplemental study, then, establish the baseline condition which, we presume, has been altered with the opening of the Rocks Gallery at the end of 1998.

### Method

Brief interviews were conducted in alcoves outside of the exhibition with both entering and exiting visitors. Visitors were asked to look at five rock and gem specimens that were presented on a cart without identifying labels. The specimens consisted of (a) a large, cut topaz, (b) a quartz formation, (c) a natural formation of pure copper, (d) a large gneiss with one cut and polished surface, and (e) a meteorite with one cut and polished surface that had been treated in order to highlight its composition.

Using a structured questionnaire, the interviewer asked visitors a series of open-ended questions about the specimens, including which of them were familiar, what they were, which was the oldest, which was the youngest, where things like these come from and how they were formed. They were also asked some of the same questions as in the survey, including demographic and visit characteristics.

Responses were tape-recorded and an interviewer's assistant also recorded answers to identification questions, and questions about demographic and visit characteristics on an answer sheet.[21]

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[21] See section X. of this report for questionnaire and answer sheet.

<u>Results</u>

Very few visitors used the technical vocabulary of geology. The technical terms that were mentioned in the discussions were "sedimentary," "igneous," "gneiss," "stratified," "metamorphic," and "inclusions." Out of 66 entering visitors and 54 exiting visitors who were interviewed in this supplemental study, only 10 entering visitors and 6 exiting visitors used at least one of these terms.

In discussing these specimens, visitors mentioned 11 different ways that rocks or gems are formed (see Table VIII.4). On average each person mentioned one process (1.4 on entrance, 1.2 on exit). There were no significant differences between entrance and exit in either the number of visitors mentioning a particular method, nor in the prevalence of a particular method among all mentions.

Discussion

The survey study, like the tracking study, indicates that GGM visitors were especially focused on the gems. Overall the National Gem Collection was the most visited gallery, the most crowded gallery, and the most interesting gallery, while the Mine was considered the least interesting gallery. Even so, visitors whose most satisfying experience in the exhibition was learning something tended to be a little more interested in the Mine and a lot less interested in the National Gem Collection.

The amount of time that visitors spent in the exhibition as a whole seems to have an important impact on what it suggested to them about the earth. Although visitors over-estimated their time in the exhibition by a factor of two, we can separate them into the fastest third (those who said they spent less than 15 minutes), the middle third (16 to 40 minutes), and the slowest third (over 40 minutes). The fastest visitors were most likely to say that the exhibition suggested that the earth is dynamic or old; the middle third of visitors were most likely to express appreciation for the earth's beauty, complexity, power and wonder. The third who spent longest in the exhibition were most likely to say that the exhibition suggested the earth's abundance, variety, richness and fragility. Unfortunately we cannot say whether this reflects an effect of the exhibition or the predisposition of visitors.

The satisfying experiences reported by visitors suggest that the exhibition effectively balanced information and object presentation. Out of every ten visitors, four said that their most satisfying experience was cognitive and three said that their most satisfying experience was an appreciation of the objects. The data can also be seen as suggesting that satisfying interpersonal experiences may have been adversely affected by the crowding in the National Gem Collection.

As in the tracking study, one of the most striking results here is the relative lack of enthusiasm for the Plate Tectonics Gallery and the Moon, Meteorites, and Solar System Gallery.

Supplemental interviews conducted with a separate sample of visitors discussing rock and gem specimens did not result in any significant differences between entering and exiting visitors.

# Tables: A Survey of Visitors

## Table VIII.1
### Exhibition Suggestions about the Earth

| Suggestion | Educational Objective |
|---|---|
| The Earth is dynamic and complex. "The earth is continually changing." | Knowledge |
| The Earth is old. "It's old. It's difficult to put things in perspective." | Knowledge |
| The Earth holds rare and valuable things within it. "The earth can produce many valuable things." | Stewardship |
| The Earth is plentiful and full of variety. "Numerous minerals - there are minerals and gems everywhere on earth." | Stewardship |
| We need to conserve the Earth's resources. "How fragile we are, we need to keep monitoring things." | Stewardship |
| The Earth is full of beauty. "There's a lot of beauty under a lot of plainness." | Appreciation |
| GGM suggested positive things about the Earth. "It's amazing place." | Appreciation |
| GGM presented a spiritual message. ""A lot of fascinating things in God's creation." | Appreciation |
| The Earth is a powerful entity and humans are merely one part of that. "How everything in the universe is connected." | Appreciation |
| There is much we do not know about the Earth. "It's fascinating. There's a lot we have to learn about. I wonder about the future." | Appreciation |

Table VIII.2
<u>Satisfying Experiences of Exiting GGM Visitors</u>
Examples from the Interviews

## Object Experiences

I was moved by beauty.

"Overall, just the natural beauty that the earth possesses is what moved me."

"The size, cut and craftsmanship."

"Crystals - the formation of the crystals."

I saw valuable things.

"The Hope Diamond."

I saw unusual things.

"I've never seen stones that big. The size is what was unusual."

"The difference in all the mineral formations was unusual. Also how they formed was strange."

"The meteor inside was very unusual. You don't see those everyday."

"The mountains are still being formed."

"I think everything in there is unusual because I've never seen objects like that before."

## Cognitive Experiences

I gained knowledge or information.

"How they formed was new to me. I also did not know about how they shaped them."

"I didn't know where [the Hope Diamond] had come from originally."

"How to find the age of things."

"How things were really mined - saw in natural state before polished."

"Ruby is not red, but rather reflects all other colors except red."

"About meteorites - I usually think of them as rocks, not iron with patterns in them."

(cont.)

Table VIII.2 (cont.)
Satisfying Experiences of Exiting GGM Visitors

## Cognitive Experiences (cont.)

I enriched my understanding.

"The background of gems and tiaras - how crystals are formed."

"Never seen surface of meteorites before - interactive earthquakes, see part of country where earthquakes happen."

I continued my professional development.

"[I'm a] wholesaler of gemstones."

"I get to see things I'm learning about in class for myself."

## Interpersonal Experiences

I saw my children learning new things.

"Children saw things they had never before and had only heard of. It's different seeing things in person than just seeing them in a book."

"When [they] saw where earth plates were compared to where we live - if we lived on a fault line."

"[They] got to learn about the history of historical figures through learning about what jewels they owned."

"It's good that they can interact, read, and visualize then and there - not like it's on a film · you can truly see the rocks and the minerals."

I spent time with friends and family.

I recalled my travels, childhood experiences, or other memories.

"[Going with] my family to museums with gems and minerals in Denver."

"We were talking about quartz crystals. I had those all around the woods by my house when I was little. I'd break them open and look inside."

(cont.)

Table VIII.2 (cont.)
Satisfying Experiences of Exiting GGM Visitors

**Dreaming Experiences**

I imagined other times and places.

" In the past. The Napoleonic era is where I pictured myself. It was fun to picture myself wearing those gems."

"Imagining what people must have been like - wealth in the upper class, poverty in the lower class - two extremes. I wouldn't want to live then."

"I remembered the times I came here before, in the past."

I thought what it would be like to own such things.

"I wouldn't mind having any of those sapphires."

I felt a spiritual connection.

Table VIII.3
Most Satisfying Experience of GGM Visitors
(Percentage of visitors with a satisfying experience)*

| Cluster | Satisfying experience | Children Learning Included ** | Omitted** |
|---|---|---|---|
| Children | | | |
| | I saw my children learning new things. | 16 | — |
| | | | |
| Objects | | 34 | 38 |
| | I saw valuable things. | 4 | 7 |
| | I was moved by beauty. | 13 | 14 |
| | I saw unusual things. | 17 | 17 |
| | | | |
| Cognitive | | 25 | 32 |
| | I gained knowledge or information. | 20 | 23 |
| | I enriched my understanding. | 5 | 9 |
| | | | |
| Introspective | | | |
| | Interpersonal | 13 | 18 |
| | I recalled my travels, childhood experiences or other memories. | 4 | 8 |
| | I spent time with friends & family. | 8 | 9 |
| | | | |
| | Dreams | 11 | 11 |
| | I thought what it would be like to own such things. | 6 | 6 |
| | I felt a spiritual connection. | 0 | 0 |
| | I imagined other times & places. | 4 | 4 |
| | | | |
| Unclustered | | 2 | 2 |
| | I continued my professional development. | 2 | 2 |
| | Other | 0 | 0 |
| Total | | 100 | 100 |

* Visitors who did not provide their most satisfying experiences are excluded from the calculations.
** The first column presents the actual "most satisfying experience."
The second presents the "most satisfying experience" exclusive of seeing children learning.
*** The percentage for children learning is the based on first or second most satisfying experience.
Percentages are based on the first or second experience excluding children learning.

Table VIII.4
Processes of Rock and Gem Formation
(In Percent)

| Process of formation | Percent of Visitors |
|---|---|
| Heat | 39 |
| Dripping | 18 |
| Crystallization | 17 |
| Sediment | 14 |
| Pressure | 13 |
| Volcanic | 10 |
| Weather | 6 |
| Water | 4 |
| Chemical reaction | 4 |
| Other | <u>6</u> |
| Total* | 132 |

* Does not equal 100%. Respondents could mention more than one process.

## H: Moon, Meteorites & Solar System



Earth Door

Our Solar System

Lunar

Impact

M E T E O R I T E S · 5 8 ·

to Balcony

Locations on map: 1, 2, 3V, 4, 5T, 6, 7, 8, 9, 10, 11, 12P, 13, 14CI, 15, 16, 17, 18T, 19V, 20, 21H, 22, 23, 24P, 25, 26V, 27, 28V, 29, 30T, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40V, 41, 42, 43, 44, 45
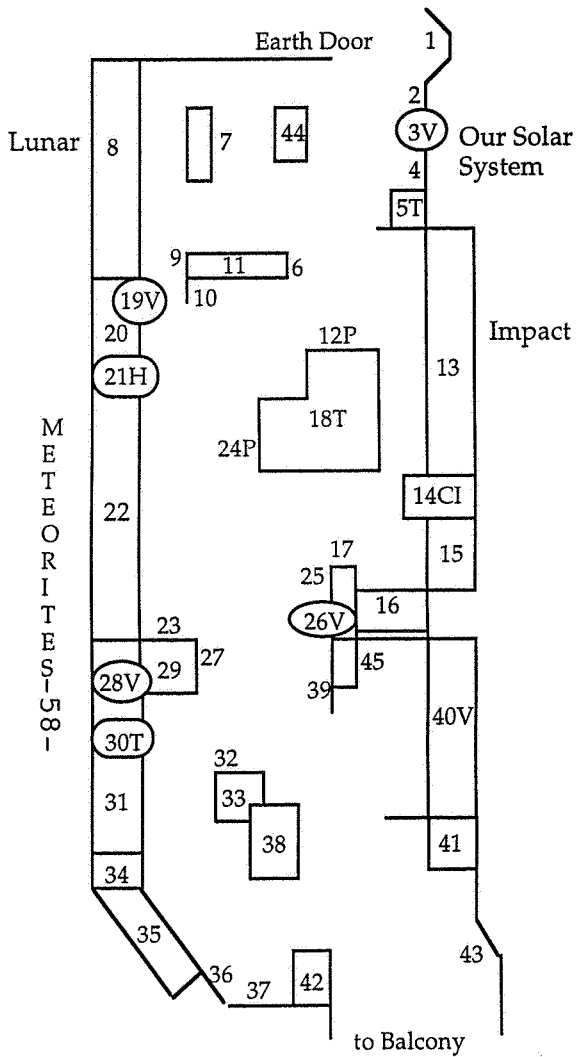
## H: Moon, Meteorites, & Solar System

| | Loc | Start | Stop | Activ. | Comments |
|----|-----|-------|------|--------|----------|
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| Activities | | L: Look at/Watch Inter. |
|------------|--|-------------------------|
| U: Using | | G: Talking to Guard |
| D: Doing together | | P: Photogr/Videotaping |
| C: Calling attention | | W: Waiting to view |

## Geology, Gems, and Minerals Hall

Gender:  M  F          ID _____

Age: _____          (office)

Race/Ethnic: _____

Group Size: _____

Group Composition:          adults & kids

alone        grp adults          0-6 _____

couple       grp teens          6–12 _____

over 12 _____

Selection Location:   stairs   elevator

1st Gallery: _____

Time Begin: _____

Time End: _____

Tracker: _____

Session: _____

Segment:       1   2   3   4   5   6

Additional Notes:

## B: National Gem Collection
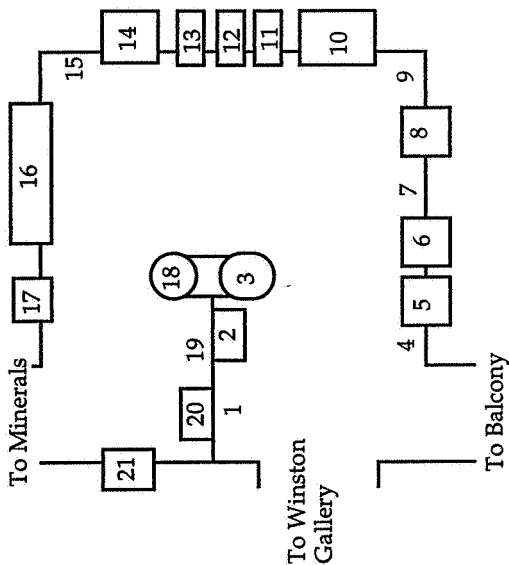


To Minerals

To Winston Gallery

To Balcony

Door:     Open     Closed

Crowd Level: High   Moderate   Low

Notes on Security Action:

Notes on Visitor Action:

## A: Winston Gallery

| Loc | Start | Stop | Activ. | Comments |
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| Activities | | L: Look at/Watch Inter. |
|---|---|---|
| U: Using | | G: Talking to Guard |
| D: Doing together | | P: Photogr/Videotaping |
| C: Calling attention | | W: Waiting to view |

## A: Winston Gallery
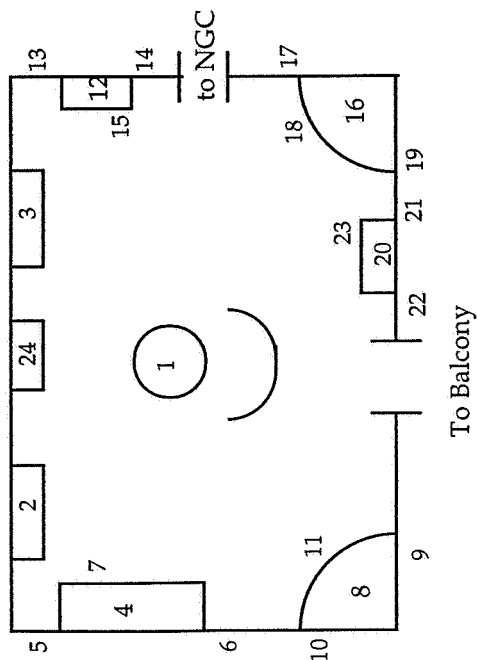


to NGC

To Balcony

Door:     Open     Closed

Crowd Level: High   Moderate   Low

Notes on Security Action:

Notes on Visitor Action:

## B: National Gem Collection

| | Loc | Start | Stop | Activ. | Comments |
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| Activities | | L: Look at/Watch Inter. |
|---|---|---|
| U: Using | | G: Talking to Guard |
| D: Doing together | | P: Photogr/Videotaping |
| C: Calling attention | | W: Waiting to view |

## C: Minerals and Gems Gallery

Pegmatites

to Mine    Growth

59  60
61
58
57
56
52
54P  55 T
53
40
39

Amazing
Gems

37 P
38
36 P
35
34
33
64

63  50
49
62
51
48
47
46
45
44
43
41
30

Diversity

26  27
25
24  31
23
21  22
29

32
20
19
V

Color

18
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17
11
16
6 T
5
4
1

to NGC

28
14
13  Shape
12
10
7  9
2  3  8
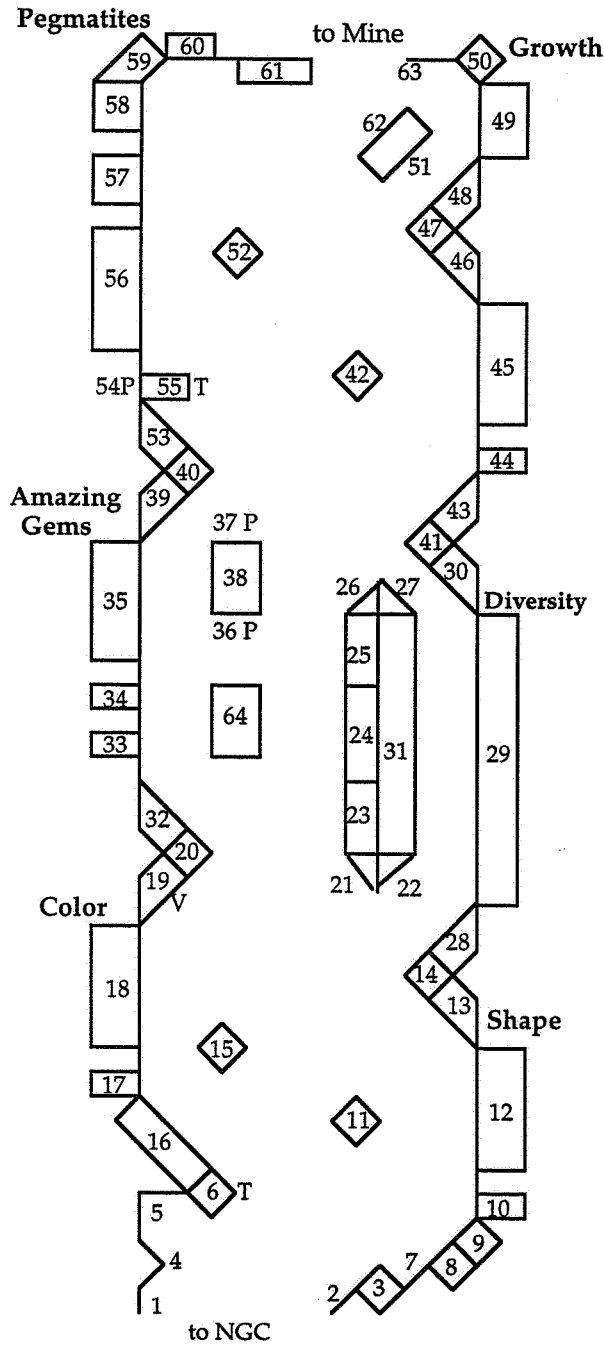
## C: Minerals and Gems Gallery

| | Loc | Start | Stop | Activ. | Comments |
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| Activities | | L: Look at/Watch Inter. |
|---|---|---|
| U: Using | | G: Talking to Guard |
| D: Doing together | | P: Photogr/Videotaping |
| C: Calling attention | | W: Waiting to view |

## D: Mine Gallery

| Loc | Start | Stop | Activ. | Comments |
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| Activities | | | |
|------------|------------|-----------------------|-------------------------|
| U: Using | | L: Look at/Watch Inter. | |
| D: Doing together | | G: Talking to Guard | P: Photogr./Videotaping |
| C: Calling attention | | | W: Waiting to view |

D: Mine Gallery



-61-

## E: Rocks Gallery



To Theater

To Mine

Rocks Carts Open?    Y    N

How Many?              1    2

# E: Rocks Gallery

| | Loc | Start | Stop | Activ. | Comments |
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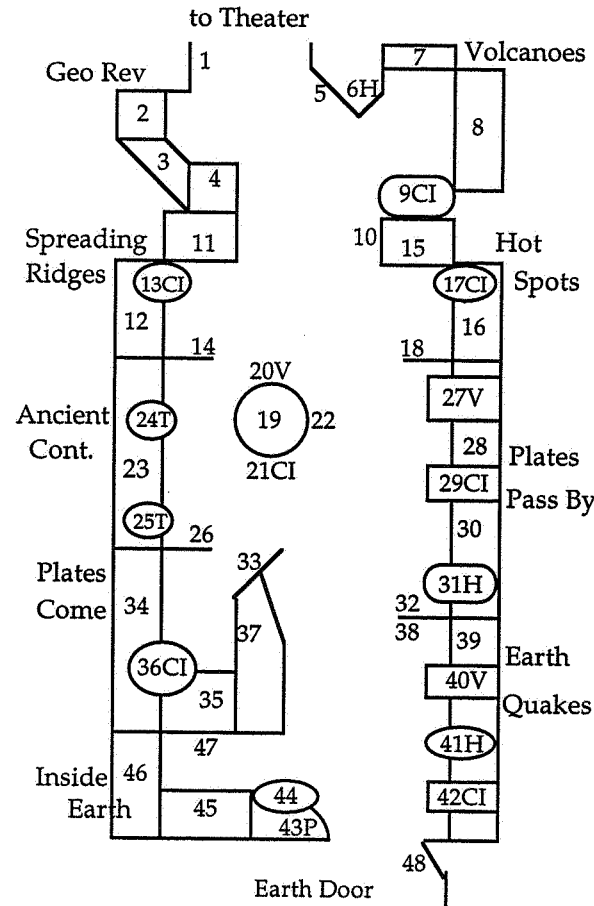| Activities | | L: Look at/Watch Inter. |
|---|---|---|
| U: Using | | G: Talking to Guard |
| D: Doing together | | P: Photogr/Videotaping |
| C: Calling attention | | W: Waiting to view |

## F: Plate Tectonics Theater



To Rocks

To Plates
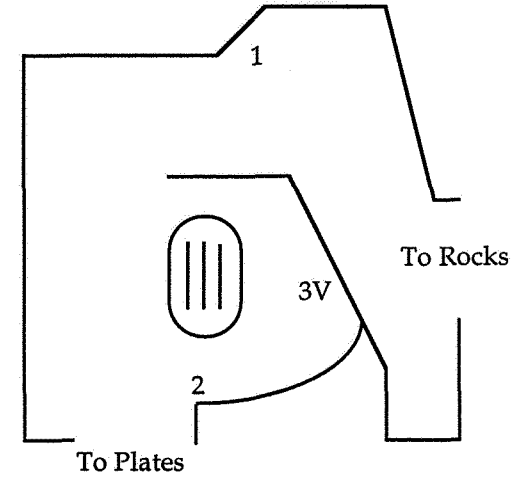
## F: Plate Tectonics Theater

| Loc | Start | Stop | Activ. | Comments |
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| Activities | |
|------------|---------------------------|
| U: Using | L: Look at/Watch Inter. |
| D: Doing together | G: Talking to Guard |
| C: Calling attention | P: Photogr/Videotaping |
| | W: Waiting to view |

## G: Plate Tectonic Gallery

to Theater

Geo Rev — 1

2

3 — 4

Spreading Ridges — 11

13CI

12 — 14

Ancient Cont. — 24T

23

25T — 26

Plates Come — 34

36CI

35

47

Inside Earth — 46 / 45 / 44 / 43P

33 / 37

20V / 19 / 22 / 21CI

5 6H / 7 Volcanoes

8

9CI

10 / 15 Hot

17CI Spots

18 / 16

27V

28 Plates

29CI Pass By

30

32 31H

38 / 39 Earth

40V Quakes

41H

42CI

48

Earth Door

## G: Plate Tectonics Gallery

| Loc | Start | Stop | Activ. | Comments |
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| Activities | |
|------------|---------------------------|
| U: Using | L: Look at/Watch Inter. |
| D: Doing together | G: Talking to Guard |
| C: Calling attention | P: Photogr/Videotaping |
| | W: Waiting to view |

**ROCKS**
(under construction)

**D**

**MINE**

**E**

**VOLCANOES &**
**PLATE TECTONICS**

**C**

**GEMS &**
**MINERALS**

**F**

**MOONS &**
**METEORITES**

**B**

**NATIONAL GEM**
**COLLECTION**

**HOPE DIAMOND**

**A**

**GEOLOGY, GEMS, AND MINERALS HALL**

GGM Entrance 98    id ☐☐☐☐   interv ☐☐   TIME ☐☐ : ☐☐   Count _____

*Hi. My name is _____. I work for the Smithsonian.*
*I'm talking to people today about their visit.*

**1. Is today your first visit to this museum?**

○ Yes  [goto Q2]      ○ No

**1a. How many times have you been here before today?**
_____    ☐☐ q1atimes

**2. What time did you enter the museum today?**
_____   time ☐☐ : ☐☐

**3. Was there something in particular you wanted to see or do in this museum?**  ○ Yes  What was that?   ○ No

q3a1st ☐☐    ___GGM General
          ___Hope Diamond
q3a2nd ☐☐   ___Gems specif.
          ___Cultural Halls
q3a3rd ☐☐   ___Dinosaurs
          ___Mammals
q3a4th ☐☐   ___Insects
          ___Marine Ecosys.
q3a5th ☐☐   ___Misc. Nat. Hist.

**3b. Anything else?/other**
_____

**4. Did you visit or do you plan to visit the GGM exhibition today?**

○ Visited     ○ Plan to     ○ Neither

**5. What led to your decision to visit the GGM exhibition today?**   (Mark all that apply.)

○ a. see Hope D.            ○ e. wanted to learn

○ b. interest/collect       ○ f. wandered in

○ c. recommend/companion    ○ g. other

○ d. reputation/SI highpoint
                            ☐☐ ☐☐
                         q5oth2  q5oth1

**If FIRST time museum visitor, goto Q13.**

**6. IF REPEAT: Have you visited the GGM exhibition before today?**

○ Yes   **Q6a. When was that?**
○ No                          ☐☐ / ☐☐

**13. On a scale from 1 to 10, where 1 is not at all tired and 10 is exhausted, how would you rate yourself right now?**

_____   q13tired ☐☐

**14. Have you visited other exhibitions in the museum today?**

○ Yes               ○ No  [goto Q20]

**14a. Which of those did you enjoy the most?**

_____  If 1: Did you enjoy it?

☐☐ ☐☐        ○ Yes  ○ No  Why not? goto Q20
q14a  q14b   _____

**15a. On this card are some of the kinds of experiences that people have told us were satisfying to them in exhibitions. [show card] Which one comes closest to describing your most satisfying experience in (exh. from above) today?**

**What is your second choice?     Third choice?**

○ b. moved by beauty.         ○ c. children learning

○ g. time w/friends/family    ○ p. professional devel.

○ r. saw valuable things      ○ o. own such things

○ k. gained knowledge/info    ○ m. recalled memories

○ s. spiritual connection     ○ t. saw unusual things

○ i. imagined times/places    ○ x. other

○ u. enriched understanding   _____

2nd _____   3rd _____   _____

**15b. Your first choice was_____.**
Probes:
b. What was especially beautiful?
g [No Probe]
r. What was especially valuable?
k. Can you give me an example?
s. With what did you feel a connection?
i. Can you tell me more about that?
u. Can you give me an example?
c. Can you give me an example?
p. Can you tell me more about that?
o. What things did you think about owning?
m. What did you recall?
t. Can lyou give me an example?
x. Other: Can you tell me more about that?

☐☐ ☐☐
q15sat2  q15sat3

20969

id _____

**\*20. Where do you live?**

○ Washington, DC

○ MD/VA suburbs          statecty [ ][ ][ ]

○ Other US _____

○ Foreign _____

**\*21. Who are you here with today?**

○ Alone                    ○ Adults w/children*

○ One other adult*         ○ Group of teens*

○ Several adults*          ○ Tour group

○ Child(ren)*              ○ School group

○ Adult w/children*

**21a. What is/are the ages of your family/grp. members?**
**Are you related? or How are they related? ( & gender)**

Adults                    Children

_____

**\*22. What is your age?_____**          age [ ][ ]

**23. What is your occupation?**

_____          occup [ ][ ]

**24. What is the highest level of education you have completed?**

○ HS grad or less          ○ Bachelor's degree

○ Assoc/Jr/Tech            ○ Some graduate study

○ Some college             ○ MA/Ph.D/Profess.

**\*25. What is your cultural/racial/ethnic identity?**

○ African American/Black   ○ Hispanic/Latino

○ Asian/Pac. Islander      ○ Native Am./AK Native

○ Caucasion/White          Other_____
                                              ○

**\*26. Mark gender:**     ○ Female     ○ Male

Q15 Follow-up:

[ ]

[ ] extra1          [ ] extra5

[ ] extra2          [ ] extra6

[ ] extra3          [ ] extra7

[ ] extra4          [ ] extra8

Administrative Information:

| segment | type | location |
|---|---|---|
| ○ 1 | ● enter | ○ Stairs |
| ○ 2 | ○ exit | ○ Elev |
| ○ 3 | | |
| ○ 4 | status | |

session [ ][ ]

○ Interview   ○ Ref: lang

○ SI staff    ○ Ref. other

○ Inelig.

card  ○ a   ○ b   ○ c

20969

GGM Exit 98   id ☐☐☐☐   interv ☐☐   TIME ☐☐ : ☐☐   Count _____

*Hi. My name is ____. I work for the Smithsonian.*
*I'm talking to people today about their visit.*

**1. Is today your first visit to this museum?**

    ○ Yes  [goto Q2]     ○ No

**1a. How many times have you been here before today?**

_____  ☐☐ q1atimes

**2. What time did you enter the museum today?** time ☐☐ : ☐☐

_____

**3. Was there something in particular you wanted to see or do in this museum?**  ○ Yes  What was that?     ○ No

q3a1st ☐☐     ___GGM General
              ___Hope Diamond
q3a2nd ☐☐    ___Gems specif.
              ___Cultural Halls
q3a3rd ☐☐     ___Dinosaurs
              ___Mammals
q3a4th ☐☐     ___Insects
              ___Marine Ecosys.
q3a5th ☐☐     ___Misc. Nat. Hist.

**3b. Anything else?/other**

_____

**5. What led to your decision to visit the GGM exhibition today?** (Mark all that apply.)

○ a. see Hope D.      ○ e. wanted to learn

○ b. interest/collect   ○ f. wandered in

○ c. recommend/companion   ○ g. other

○ d. reputation/SI highpoint

☐☐ ☐☐
q5oth2  q5oth1

**IF FIRST time museum visitor, goto Q7.**

**6. IF REPEAT: Have you visited the GGM exhibition before today?**

○ Yes   **Q6a. When was that?**

○ No   _____   ☐☐ / ☐☐

**7. How long did you spend in the exhibition?**

_____   ☐☐☐ min

☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐
extra1  extra2  extra3  extra4  extra5

**Here is a map of the exhibition.** (Hand the map.)

**8. Where did you enter the exhibition?**    ○ F   ○ A   ○ B

**9. Can you show me on the map what path you took through the exhibition?** _____

q9path ☐☐☐☐☐☐☐☐☐☐

**10. Which of the areas you visited did you find most interesting?**   ○ A   ○ B   ○ C   ○ D   ○ E   ○ F

    **10A. Why?**_____   ☐☐ q10why

**11. Which area did you find least interesting?**

    ○ A   ○ B   ○ C   ○ D   ○ E   ○ F

    **11A. Why?** _____   ☐☐ q11why

**12. Did you feel that any of the galleries were crowded?**

○ Yes: Which one was most crowded?

○ No       ○ A   ○ B   ○ C   ○ D   ○ E   ○ F

    **How did that affect your visit?**   ☐☐ q12how

_____

**13. On a scale from 1 to 10, where 1 is not at all tired and 10 is exhausted, how would you rate yourself right now?**

_____   ☐☐ q13tired

**15. Overall, did you enjoy the exhibition?**   q15not

    ○ Yes   ○ No:  Why not? _____   ☐☐

**15a. On this card are some of the kinds of experiences that people have told us were satisfying to them in this exhibition. show card] Which one comes closest to describing your most satisfying experience in GGM today?**

**What is your second choice?  Third choice?**

○ b. moved by beauty.     ○ c. children learning
○ g. time w/friends/family   ○ p. professional devel.
○ r. saw valuable things    ○ o. own such things
○ k. gained knowledge/info  ○ m. recalled memories
○ s. spiritual connection    ○ t. saw unusual things
○ i. imagined times/places   ○ x. other
○ u. enriched understanding

2nd       3rd

_____     _____

60772

**15b. Your first choice was_____.**
Probes:
b. What was especially beautiful?
g [No Probe]
r. What was especially valuable?
k. Can you give me an example?
s. With what did you feel a connection?
i. Can you tell me more about that?
u. Can you give me an example?
c. Can you give me an example?
p. Can you tell me more about that?
o. What things did you think about owning?
m. What did you recall?
t. Can lyou give me an example?
x. Other: Can you tell me more about that?

Q15 Follow-up:

id _____

q15sat2    q15sat3

**16. When you read text and panels, how did you decide which text to read?** Mark all that apply.

○ Object was interesting
○ Related to personal experience or knowledge
○ Read what I could see (crowded)
○ Caption interesting
○ Aesthetics of label (attractive, readable)
○ Read all or in order
○ Other: _____ q16other

**17. What type of information was interesting to you?**
Mark all that apply.

q17other

○ Scientific/Geological
○ Social History
○ Ownership
○ Geographic Origin
○ Other: _____

**18. What did the exhibition as a whole suggest to you personally about the earth?**

**19. Have you seen exhibitions about geology, gems and minerals in other museums?**

q18earth

○ No

○ Yes: **How is this one different?**

q19how

_____

**\*20. Where do you live?**

○ Washington, DC
○ MD/VA suburbs
○ Other US _____
○ Foreign _____

statecty

**\*21. Who are you here with today?**

○ Alone                    ○ Adults w/children\*
○ One other adult\*         ○ Group of teens\*
○ Several adults\*          ○ Tour group
○ Child(ren)\*              ○ School group
○ Adult w/children\*

**21a. What is/are the ages of your family/grp. members? Are you related? or How are they related? ( & gender)**

Adults                 Children

_____

**\*22. What is your age?** _____    age

**23. What is your occupation?**

occup

_____

**24. What is the highest level of education you have completed?**

○ HS grad or less          ○ Bachelor's degree
○ Assoc/Jr/Tech            ○ Some graduate study
○ Some college             ○ MA/Ph.D/Profess.

**\*25. What is your cultural/racial/ethnic identity?**

○ African American/Black       ○ Hispanic/Latino
○ Asian/Pac. Islander          ○ Native Am./AK Native
○ Caucasion/White
Other_____ ○

**\*26. Mark gender:**

○ Female
○ Male

60772

| session | segment | type | location | card | status | |
|---|---|---|---|---|---|---|
| | ○ 1 | | | | | |
| | ○ 2 | ○ enter | ○ Stairs | ○ a | ○ Interview | ○ Ref: lang |
| | ○ 3 | ● exit | ○ Elev | ○ b | ○ SI staff | ○ Ref. other |
| | ○ 4 | | | ○ c | ○ Inelig. | |

## Supplemental Interview Questionnaire

Hello, my name is _____ and I work for the Smithsonian. Today I'm talking to visitors about this exhibition. I have some things I'd like to show you from the collection.

1. Are any of these familiar to you? Which ones?

1A. Other than in this museum, have you seen things like this elsewhere? Which ones? Where did you see them?

2. Can you tell me anything about them? [What makes you say that?]

3. Any others? Can you tell me anything about any others?

4. Where do think these objects came from? What kinds of places?
4A. How do you think they might have been formed?

5. Can you tell which is the oldest? The youngest?

6. What do the objects here suggest to you about the Earth?

**STOP RECORDING**

Now, I just have a few questions about you and your visit.

7. Is today your first visit to this museum?
7A. If NO: How many times have you been here before today?
7B. When was your last visit?

8. Today, have you visited the gems and minerals exhibition?
8A: IF REPEAT MUSEUM VISITOR: How about before today?
8B. If 8A=YES: When was that? (Month/Year)

9. **Where are you from?** [Where do you live?]

10. **Who are you here with today?** What are the ages of your family/group members? Are you related? or How are they related?

11. **What is your age?**

12. What time did you enter the museum today?

13. When you came to the museum today, was there anything in particular that you wanted to see? What was that?

**EXIT ONLY**

14. What time did you enter the exhibition?

15. Here is a diagram of the exhibition. Which galleries did you visit?
15A. In which one did you spend the most time?

16. Did you use any of the hands-on or computer interactives in the exhibition? Which ones did you like?

17. Did you watch any of the videos? Which ones did you like?

18. Would you say that you read almost all of the information on the text panels and labels, more than half, less than half, or almost none?

19. What is your occupation?

20. What is the highest level of education you have completed?

Thank you for your time.
(Give gift)

GGM Specimen 98
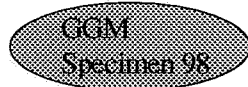
id ☐☐☐ interv ☐☐ TIME ☐☐:☐☐ Count _____

**1. Are any of these familiar to you? Which ones?**

○ Yes | ○ A. Topaz ○ C. Copper ○ E. Meteorite
○ No | ○ B. Quartz ○ D. Rock

**1A. Have you seen any elsewhere? Which ones?**

○ Yes | ○ A. Topaz ○ C. Copper ○ E. Meteorite
○ No | ○ B. Quartz ○ D. Rock

Where? _____

**2 and 3. Can you tell me anything about them?**
Which did they talk about?

○ A. Topaz ○ C. Copper ○ E. Meteorite
○ B. Quartz ○ D. Rock

**4. Where did they come from? Which did they talk about?**

○ A. Topaz ○ C. Copper ○ E. Meteorite
○ B. Quartz ○ D. Rock

**4A. How formed? Which do they talk about?**

○ A. Topaz ○ C. Copper ○ E. Meteorite
○ B. Quartz ○ D. Rock

**5. Oldest?**      Youngest?

○ A. Topaz ○ D. Rock | ○ A. Topaz ○ D. Rock
○ B. Quartz ○ E. Meteorite | ○ B. Quartz ○ E. Meteorite
○ C. Copper | ○ C. Copper

**6. Suggestions about the Earth?** ○ Yes ○ No

☐ (box)

**7. Is today your first visit to this museum?** ○ Yes ○ No …

**7a. How many times have you been here before today?**

☐☐ q7times    **7b. Date of last visit** ☐☐ / ☐☐ month/year

**8. Today, visited GGM?** ○ Yes ○ No   **8b. When?** ☐☐ / ☐☐

**8a. Before today?** ○ Yes ○ No

**9. Where do you live?** ☐☐☐ statecty

○ Washington, DC ○ Other US _____
○ MD/VA suburbs ○ Foreign _____

**10. Who are you here with?**

○ Alone ○ Adults w/children
○ One other adult ○ Group of teens
○ Several adults ○ Tour group
○ Child(ren) ○ School group
○ Adult w/children

Relation, Gender and Ages: ☐ (box)

**11. What is your age?** _____ age ☐☐

**12. What time did you enter museum?** entermus ☐☐:☐☐

**13. Anything in particular you wanted to see?** ○ Yes ○ No

**13a. What was that?** ☐☐ ☐☐

EXIT _____

**14. What time did you enter exhib.?** ☐☐:☐☐

**15. Galleries visited?**     **15a. Most time?**

○ A. Hope D. ○ D. Mine | ○ A. Hope D. ○ D. Mine
○ B. Nat. Col. ○ E. Vol-plate | ○ B. Nat. Col. ○ E. Vol-plate
○ C. Gems-min ○ F. MoonMet | ○ C. Gems-min ○ F. MoonMet

**16. Hands on/interactives.?** ○ Yes ○ No ○ q

○ a ○ b ○ c ○ d ○ e ○ f ○ g ○ h
○ i ○ j ○ k ○ l ○ m ○ n ○ o ○ p
like
○ a ○ b ○ c ○ d ○ e ○ f ○ g ○ h
○ i ○ j ○ k ○ l ○ m ○ n ○ o ○ p
○ q

**17. Videos.?** ○ Yes ○ No

○ a ○ b ○ c ○ d ○ e
○ f ○ g ○ h ○ i ○ j
like
○ a ○ b ○ c ○ d ○ e
○ f ○ g ○ h ○ i ○ j

**18. Text read?**
○ almost all ○ > half ○ < half ○ almost none

**19. What is your occupation?** _____ occup ☐☐

**20. What is the highest level of education you have completed?**

○ HS grad or less ○ Bachelor's degree
○ Assoc/Jr/Tech ○ Some graduate study
○ Some college ○ MA/Ph.D/Profess.

**\*21. Mark gender:** ○ Female ○ Male

| location | type | segment | | session | status | |
|---|---|---|---|---|---|---|
| | | ○ 1 | ○ 5 | | ○ Interview | ○ Ref: lang |
| | | ○ 2 | ○ 6 | | ○ SI staff | ○ Ref: other |
| ○ Stairs | ○ enter | ○ 3 | ○ 7 | | ○ Inelig. | |
| ○ Elev | ○ exit | ○ 4 | ○ 8 | | | |

2728