visitor voices

IN MUSEUM EXHIBITIONS

EDITED BY

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and

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INTRODUCTION

Beginning a Dialogue

This book has taken some time to find its own voice. It began years ago with our independent experiences of the power of visitor contributions to our exhibitions and continued with ongoing conversations and plans to document our observations and reflections. This led in 2003 to collaboration on a special issue of the *Journal of Museum Education* and, ultimately, to this collection.

With the help of many colleagues, we have gathered accounts going back to the 1970s of efforts to engage visitors as contributors to exhibitions and active participants in museum conversations. Included are examples from children's museums and science centers, natural history museums and art galleries, history museums and living collections, and a few from beyond museum walls. And this is only a modest sampling of the increasing number of experiments with visitor-contributed content now taking place.

In sharing their experiences, the authors represented in this book speak of comments and feedback, talk-backs and speak-outs, memories, reflections, and dialogue. They tell of visitors recording their stories in video kiosks, posting their thoughts on web sites, and inscribing themselves in guest books and comment sheets, on sticky notes and index cards, and sometimes directly on the wall.

While there's no one term to describe these communications, and media vary from pencils to podcasts, together they add up to a type of experience that constitutes a fundamental shift in the way museums create exhibitions and programs—at the very least, an acknowledgment that people who come to museums have stories, opinions, and reflections that are worth listening to.

The title of this book doesn't completely capture our intentions. The word "visitor" seems outmoded, but so far there's no better, generally understood alternative. We considered words like "dialogic" and "convivial," which reflect the spirit of this approach but have too small a following. "Voices" also seems to stop short of the variety of modes of making and creating that are described throughout. And, although visitors' voices enter into museums in many ways (in interviews with evaluators and on exhibition advisory teams, to name just two), our focus is more narrowly on contributions within exhibitions and around the edges, in newer modes like podcasts.

So we've opted for familiar terms and a title that captures the values implicit in the opening lines of Walt Whitman's *Leaves of Grass:*

> Now I make a leaf of Voices—for I have found nothing mightier than they are,
> And I have found that no word spoken, but is beautiful, in its place.

No matter what we call these types of communications and the people who create them, it is time to take stock of what has been learned during this period of experimentation and to establish a more secure space for visitors' voices within museums.

Acknowledgments

We are grateful to all of the authors who contributed to this book, and to those whose voices and ideas have been part of the larger conversation—in correspondence, conference sessions, and writing that may not be represented here.

We thank the Museum Education Roundtable for permission to reprint and adapt articles that appeared in the *Journal of Museum Education*; the Mid-Atlantic Regional Center for the Humanities for permission to reprint and adapt an article that appeared in *Cross-Ties: News and Insights for Humanities Professionals*; and all who contributed images, including many of the authors and their colleagues. (Photo credits appear at the end of the book.)

We have followed the authors' decisions about how to present the many visitors' statements included here. Some were signed and dated, others not. In nearly all cases, spelling and grammar are unchanged. We thank Carolyn Sutterfield of ASTC for her careful copyediting and Gordon Chun of Berkeley, California, for his design.

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And we are grateful to all of the visitors who make the time and the effort to engage.

Kathleen McLean
Wendy Pollock

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Voice of the People

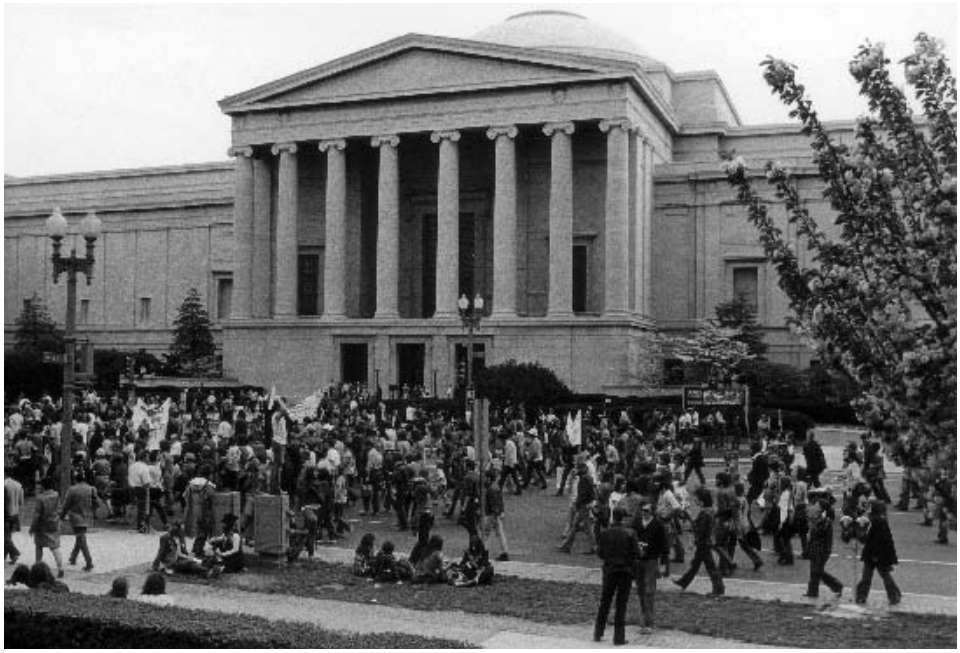
Wendy Pollock

In traditional museums, signs are silkscreened and labels screwed to the wall. Though conversations may be lively, they go home with the visitors, leaving no trace.

But times are changing. The curator or exhibit developer still may have the last say, but these days words in museums may come on Post-it notes and in podcasts—and it's not only the curators who are speaking.

The community: "an active agent"

The doors began to open years ago. In his planning for the Newark Museum, John Cotton Dana in the early 1900s envisioned a "new museum" that was, above all, of service to its community—not just an expensive building filled with objects in cases. "The museum that is made to order," he wrote, "not being a natural product of the community in which it appears, is the child of a passing fashion; is built about a fixed idea of what a museum should be; does not represent or issue from the life of the people by whom it is brought into being."[1] Whether it was made of marble or adorned with Corinthian columns made no difference, Dana said.



Speaking out and challenging authority were part of the ethos of the 1960s and '70s. Peace demonstrators in front of the National Gallery of Art, Washington, D.C., April 1971.

Some institutions, especially children's museums and science centers, took these ideas to heart. Visitors could not only touch and handle objects; they became part of the museum experience in the discovery rooms and hands-on exhibits that began to flourish in the late 1960s and '70s. Given the ethos of the times, making exhibits out of milk cartons and vacuum cleaners, then handing out pencils so visitors could comment on them, seemed natural, at least to some.

In the early 1970s, French museologists proposed the term "ecomuseum" for this new kind of institution that grows out of and serves as a focal point for a community's emerging identity.[2] More than one author advocated "opening the museum" and responding to changes in the community.[3]

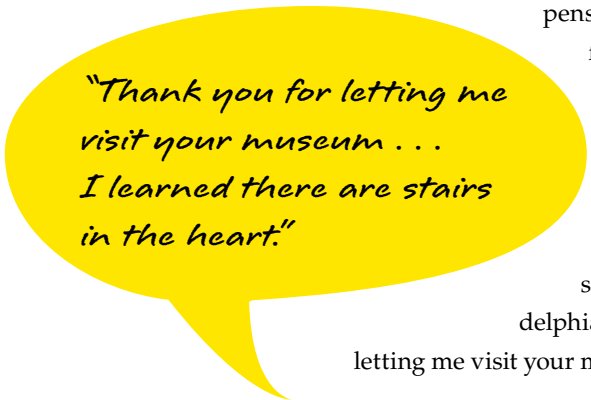
In the 1980s, the idea of the community museum worked its way increasingly into practice. John Kuo Wei Tchen wrote of the vision of a "dialogic museum" in New York's Chinatown, where experiments that began in the early 1980s challenged the tradition of a museum's "single, authoritative voice." Instead, planners of the project invited many groups to contribute photographs and documents and engage in "a dialogic exploring of the memory and meaning of Chinatown's past."[4]

Anthropologist Ivan Karp, one of the organizers of a 1990 Smithsonian Institution conference on museums and communities, wrote that "the best way to think about the changing relations between museums and communities is to think about how the audience, a passive entity, becomes the community, an active agent."[5] What then is the role of the museum, when the community is an "active agent"? No longer only "teacher, scholar, and repository," Harold Skramstad said in 1996, this new museum is also "listener, mentor, broker, care-giver, mediator, and forum."[6]

How the forum role is evolving in the practice of exhibit-making is the subject of this book.

Individual experience and meaning-making

In spirit, this book also builds on Kathleen McLean's *Planning for People in Museum Exhibitions,* which placed the individual experience at the center of what happens in museums. With visitor studies taking form as a recognized field in the 1980s, museums were beginning to pay more attention to what visitors were saying and the messages they were leaving in letters, comment books, and feedback cards. What they heard was clearly something more than gratitude and awe. Dan Goldwater, longtime educator and exhibit developer at the Franklin Institute, once described a letter he'd received sometime in the 1980s from a boy whose class had visited the Philadelphia museum, with its iconic walk-through heart. "Thank you for letting me visit your museum," the boy wrote. "I learned there are stairs in the heart."



Comment books, Barbara Stratyner observed at the New York Public Library of the Performing Arts, were serving as a kind of "invisible oral historian," but in addition to the hoped-for stories about blacklisting and jazz, complaints came in about missing pens and the way the photographs were hung.[7] Caryl Marsh, examining comment books from the traveling *Psychology* exhibition whose development she led, insisted on taking seriously every "awesome" and "this sucks." What are people trying to tell us? she wondered.

Visitors' responses weren't always anticipated or welcome, but clearly people were bringing their own experiences and perspectives to their encounters with the museum and weaving their museum memories into their own narratives. As John Falk and Lynn Dierking wrote, everyone has a "personal agenda" in visiting a museum, and this agenda strongly influences what their experience will be.[8] Research on learning reinforced this perspective about the role that prior knowledge plays in any encounter with a new experience—whether objects and text or hands-on exhibits.[9]

Shifts in the practice of "history making" also contributed to changing views of the relationships between individuals and museums. People make meaning of things and experiences in different ways—an insight, according to Lois Silverman, that might "open the door to more democratic practices in museums." "We know that visitors engage in . . . storytelling in museums all the time," she wrote. "Should that activity and those meanings continue to take second place to the interpretations of museum staff?"

> The popularity of comment books, self-made videos, and computer databases for visitor input in more and more museums suggests otherwise. Understanding the many ways we make meaning of objects in our culture may in fact help us see a wider range of behaviors that museums could be supporting and promoting. In so doing, museums could become cultural havens for, as well as models for, the respectful exploration and exchange of ideas.[10]

Contested meaning

Another set of influences has come from cultural studies and the view of museums as not just resources for individual learning, but places where meaning is negotiated on a cultural scale—sites of "multiple and heterogeneous borders . . . where different histories, languages, experiences, and voices intermingle amidst diverse relations of power and privilege," in the words of Fiona Cameron.[11]

Following the lead of museum practitioners and theorists like Eilean Hooper-Greenhill,[12] Cameron has carried out studies in Australia and Canada to probe perceptions of the museum's social role. What she has found is that most people think museums have a "social responsibility to represent contentious topics," and nearly all see museums as "places that should allow visitors to make comment."

A number of the examples we've included here are about exactly this: the museum, in its role as forum, recording and sharing multiple perspectives on topics ranging from slavery to oil spills.

Permeable walls

Meanwhile, popular culture has overtaken museologists' musings. Pick up the newspaper, turn on the television, open the wireless: Where once there were voices of authority and letters to the editor, now there are blogs, reality TV, and instant polls. We can vote for the next American Idol, send a text message to the BBC's "World Have Your Say." By August 2006, Nielsen found that half of the fastest-growing web sites in the United States were those with user-generated content.[13] By the time this book is in print, more modes for making public our private thoughts and experiences will have come and gone.

As in the news and entertainment media, possibilities for visitors to add their voices to those of the curators now go well beyond the comment card. Opening the museum is no longer necessary; the walls have disappeared.

Economics plays a role. In the media, newspapers cut costs by closing foreign bureaus[14] but add column inches for user content, like the *Washington Post*'s features "Autobiography as Haiku" and "Acts of Random Kindness." "Citizen journalists" are also selling photographs to mainstream media, thanks to the Internet.[15] With more and bigger museums, greater competition, and growing reliance on earned income, museums are subject to similar pressures. Including visitor content has economic appeal. And with demographics changing rapidly, any museum that doesn't reflect the entire community will soon become irrelevant.

All of this has meant changes in exhibitions, as visitors' voices find a place alongside those of the curators and text writers. This book surveys the scene, suggests some strategies, and raises questions about the potential and challenges of exhibit approaches that aren't just for gazing.

NOTES

1. John Cotton Dana, *The New Museum: Selected Writings by John Cotton Dana* (Washington, D.C.: American Association of Museums, 1999), 226.

2. Hugues de Varine, "Ecomuseology and Sustainable Development," *Museums & Social Issues: A Journal of Reflective Discourse* 1, no. 2 (Fall 2006): 225–231.

3. For example, Patricia A. Steuert et al., *Opening the Museum* (Boston: The Children's Museum, 1993); René Rivard, *Opening Up the Museum* (Quebec City: n.p., 1984).

4. John Kuo Wei Tchen, "Creating a Dialogic Museum: The Chinatown History Museum Experiment," in *Museums and Communities: The Politics of Public Culture*, ed. Ivan Karp, Christine Mullen Kreamer, and Steven D. Lavine (Washington, D.C.: Smithsonian Institution Press, 1992), 290.

5. Ivan Karp, "Museums and Communities: The Politics of Public Culture," in *Museums and Communities: The Politics of Public Culture*, 12.

6. Summary of Remarks by Harold Skramstad, *Museums in the Social and Economic Life of the City: Summary of a Conference* (Washington, D.C.: American Association of Museums, 1996), 45.

7. Barbara Stratyner, "Memory Books: A Method of Dialogic Retrospection in the Gallery," *Journal of Museum Education* (Spring/Summer 1995): 7–9.

8. John H. Falk and Lynn D. Dierking, *The Museum Experience* (Washington, D.C.: Whalesback Books, 1992).

9. Jeremy Roschelle, "Learning in Interactive Environments: Prior Knowledge and New Experience," in *Public Institutions for Personal Learning*, ed. John H. Falk and Lynn D. Dierking (Washington, D.C.: American Association of Museums, 1995).

10. Lois Silverman, "Making Meaning Together," *Journal of Museum Education* 18, no. 3 (Fall 1993): 7–11

11. Fiona Cameron, "Beyond Surface Representations: Museums, 'Edgy' Topics, Civic Responsibilities, and Modes of Engagement," *OpenMuseumJournal* 8 (August 2006), available at http://amol.org.au.

12. For example, Eilean Hooper-Greenhill, *Museums and the Shaping of Knowledge* (London and New York: Routledge, 1992).

13. Nielsen/Net Ratings, press release (August 10, 2006), available at www.nielsennetratings.com.

14. Robert Gavin, "Globe to Close Last Three Foreign Bureaus," *Boston Globe* (January 4, 2007).

15. For example, www.scoopt.com.

Surviving in Two-Way Traffic

Kathleen McLean

I remember a time not so long ago when the notion of including something as benign as a visitor comment book at the end of a museum exhibition was considered a risky proposition. Museum staff feared that visitors might say something unflattering, or even downright rude.

Today, that fear has subsided somewhat, as museums begin to share exhibit air time and real estate with their visitors, not only in comment books, but also in a variety of talk-back elements, video recording stations, podcasts, and blogs. And some of the more daring museums are even inviting visitors to participate in co-design, creating exhibit objects and content. While museum professionals have been talking about this forum-like nature of museums for a long time, until just recently the field has had difficulty "walking the talk."

I suspect that Internet culture is largely responsible for the current spate of visitor-contributed elements, by providing concrete examples of the power and potential richness of user contributions, and perhaps more importantly, by instilling in the public an *expectation of participation* in the creative process in some way. It took the Internet, with its social networking environments—like YouTube, Flickr, and MySpace—to bump the museum field off its one-way street and into two-way traffic. It took what some call the Web 2.0, with its open source software and architecture of participation, to create a buzz in the museum community about "Museums 2.0" and the possibility for a more open invitation to participate in museum discourse.

Of course, some visitors have never needed an invitation—their graffiti can be seen on the walls and columns of museums around the world, ancient and modern alike. And it has been partly this fear of unsolicited comment or "vandalism" that has kept museums a safe distance from the sound of visitor voices in the past. Even today, when I suggest that we loosen up the exhibition experience and stray from the weeded path by including a few elements that elicit visitor comment and co-design, many a client's first response has to do with the predictability of four-letter words and a general lack of good taste. But I suspect that, more than anything else, these attitudes about visitor participation come from a fear of losing control as the voice of curatorial and social authority.

Despite this pervasive conservatism, some museum pioneers have been inviting visitors to participate and speak up for a long time. One of the earliest documented solicitations of visitor comment was in a 1937 exhibition on electricity and light at the Science Museum, London. In U.S. museums, many of the first visitor-voice experiments came out of the Boston Children's Museum in the 1970s and out of an understanding

In the mid-1970s, the Oakland Museum of California developed a prototype "20th Century Response Center" in its history gallery to involve the public in the planning process, elicit suggestions, and promote the donation of artifacts. Visitors were encouraged to use the telephone "Hot Line" to share their stories and ideas with museum staff.

that participation can encourage and stimulate learning. Science museums were not far behind. In the early 1980s, for example, I remember being inspired by an element in the exhibition *COPAN: Ancient City of the Maya*, at the Museum of Science in Boston, in which visitors could join scientists in deciphering the meaning and use of mysterious objects, and display their conjectures for other visitors to read.

I personally stumbled upon the potential of visitor commentary as an exhibit developer for the 1979 exhibition *Freein' the Spirit: The Church in the Black Community*, at the Oakland Museum (now the Oakland Museum of California). On opening day, the printer had failed to deliver brochures for our in-gallery programs. As a stop-gap measure, I put out a small notebook for names and addresses of those interested in receiving program information in the mail. By evening's end, the book was filled, not with mailing addresses, but with comments—about this unusual exhibition, its content and intent—and with moving testimonies to the power of the spirit. After my initial surprise at this inadvertent "call and response," I remember thinking that many of the comments were more compelling than much of the exhibition text (which I had written), and were a powerful untapped resource.

It was not until I joined the Brooklyn Children's Museum in 1986 that I felt I had the creative license to experiment with different ways of soliciting on-the-spot visitor input. (In my mind, children's museums have always been one of the best places for the museum field to try new and potentially "risky" ideas.) To begin a process of redesign of all the public spaces, for example, we put up a small display of toy hammers and saws with a sign, "We Are Changing. Tell us what you think." We included some paper for visitors to record their comments. And tell us they did, demanding that we

At the Brooklyn Children's Museum, kids' typed letters to Snoopy were posted for others to read.

keep the doll exhibits and suggesting that we put in some rides. In the end, we didn't do either, which made me realize that we should take this practice more seriously. Although my motives for putting up the display were primarily to announce the coming changes, visitors took our invitation to heart and spent time articulating their thoughts.

We learned quickly that visitors would use these opportunities to communicate with us, no matter what the topic. At the exhibit Send a Letter to Snoopy, children could type on a Remington typewriter and put their "letters" into a mailbox; some of these were posted on a nearby bulletin board by museum staff. Kids lined up to carefully and slowly type their letters, much to the surprise of exhibit staff, who were worried that typing might be too difficult a task. We received dozens of letters a week, including one that described a father who inflicted physical pain on the author; the child wondered what could be done to stop him. It was signed with only a first name.

Almost every exhibition had at least one component where visitors could contribute their thoughts and feelings—in comment books, in suggestion boxes, and in exhibit elements of all kinds. This became business-as-usual for exhibit staff at the Brooklyn Children's Museum, but I was surprised to find that the practice was not embraced by the field at large. When I once again began consulting and tried to expand the notion of visitor participation to include what I called "visitor co-design"—visitors designing exhibit elements for other visitors to experience—I found very few colleagues and museums that were willing to give it a try. This was in the late 1980s and early 1990s, when many museums were just starting to realize that they might have to incorporate some form of interactivity into their exhibition galleries.

Even at the Exploratorium—the center of the "interactive" universe (long before the Internet appropriated the word)—staff were hesitant to design visitor-comment elements into their science exhibits. The Exploratorium had hosted Wendy Clarke's art installation, "Love Tapes"—arguably the first of the public video capture environments that today includes the popular StoryBooths. But it seemed like a huge leap to design physical science and life science exhibits that focused primarily on visitors' opinions. Exhibit staff said visitors would not want to slow down, stop, and write in such an active place, but I think some exhibit developers also felt visitors might not have anything of real scientific value to say.

Our first attempt, when I joined the staff, was in the exhibition *Diving into the Gene Pool*. In an exhibit on genetic engineering and genetic counseling, visitors were given two actual case studies from genetic counselors and two examples of ethical issues raised by genetic engineering. And they were asked, "What would you do in this situation?" The responses were intense, both because of the numbers of visitors who commented, and

because of the depth they went to in articulating their concerns. We gathered over 4,000 written responses, and we posted them on bulletin boards in the exhibition for other visitors to read. Not only did visitors read the responses, they also used them to initiate dialogue and conversation with other people in the exhibition. These comments eventually became the focus of a scientific study on public perceptions of genetics.

One of my favorite visitor-voice exhibits at the Exploratorium was A Memorable Century in the *Memory* exhibition. This history timeline, displayed as a large chart, only came to life when visitors posted what they considered to be significant events in history. Hundreds of comments were added to the timeline each week, including declarations like "I was born." When staff had to remove some comments to make room for new ones, the birthday announcements were among the first to go, along with the scribbles and ubiquitous proclamations of love. Some staff felt that individuals' marriage and birth dates were not valuable to the overall experience of social memory—the topic of the exhibit. Others felt they added an honest human dimension. Individually, each was a single data point; collectively, they articulated beautifully the powerful human urge to claim a conscious and acknowledged place in this world.

No matter what the content of these contributions might be, visitor-comment exhibits have always been some of my favorite elements in museum exhibitions. I love the "call-and-response" feeling of the exchange: the call from a museum and from its staff and those with expert knowledge, then the response from visitors with common knowledge and something to say. When I see a visitor writing something in an exhibition, I am reminded of election days at my neighborhood polling station: While I don't agree with every vote being cast, I am exhilarated by the potential power of participation. The very act of contributing changes the essential dynamic of the experience from a predetermined production to one of exchange and reciprocity.

In the Exploratorium's *Memory* exhibition, visitors added important events to a 100-year timeline.

Some colleagues argue that visitor comments are not usually very interesting and don't warrant precious real estate within an exhibition. That may be true to some extent, but some curatorial exhibition texts are not very interesting either. Our challenge, as exhibition and public program creators, is to encourage both curators and visitors to stretch beyond mere fact and opinion and to engage more deeply with ideas. For me, the best visitor-response exhibits—and the best exhibitions—are those that encourage playing with ideas and grappling with values—qualities that embody the potential dialogic nature of museums.

On our part, this requires letting go of some control and authority and dispelling the illusion that we, as museum workers, somehow represent a caste of communicators vested with inherently important things to say. I find it puzzling that extending an invitation for visitor comment and participation is considered by some museum colleagues to be utopian at best and more often "anti-professional," as if the inclusion of visitor comment somehow denies the expertise and scholarship of people who work in museums. I've even heard colleagues comparing themselves to medical doctors and equating visitor-contributed content with "gardeners operating on one's children."

My long-standing proposition to include more visitor-generated content in exhibitions has never been about getting rid of the expert. Rather, it comes from a conviction that the juxtaposition of expert knowledge and common knowledge in shared dialogue animates the exhibition experience and creates a sense of immediacy and exchange.

We would do well to consider our visitors PARTNERS in this learning adventure called museums.

In reality, few museum exhibition practitioners—curators, developers, designers, and educators alike—are scholars and scientists in the *expert* sense of the word. More often than not, we are well-educated citizens with some experience in translating the expertise of scientists and arts and humanities scholars into accessible cultural, social, and educational experiences. We are probably more like facilitators and talk-show hosts than creators and keepers of wisdom. On the other hand, we may be scholars in the *student* sense of the word, and as such, are much more like our visitors—lifelong learners who are interested in the world, and curious about our place within it. As fellow students, we would do well to consider our visitors *partners* in this learning adventure called museums.

The implications of partnership extend far beyond the domain of simple dialogue and inquiry. As resources become increasingly scarce, and as we continue to have to do more with less, will we, as museum professionals, be able to accomplish by ourselves all the necessary intellectual, creative, and custodial work to keep our museums operating? I think not. As we look to the future, we may do well to structure our museums to be physical "wikis," places where the users participate in the making of and caring for exhibits and programs and facilities. And we should be thinking of participation, cooperation, and partnership not only as altruistic acts and conditions of a democratic society, but also as elements of a sound and sustainable economic model.

To some extent, our museums already reside within this cooperative domain, particularly when it comes to the participation of docents, volunteers, advisory councils, and trustee boards. In the future, we should build upon this great resource of participants in new and more dynamic ways. In Europe, the model of a wiki museum is alive and well in many of the ecomuseums where resident communities take on the roles of curator, historian, and interpreter. Ecomuseums rely on the active participation of local residents, public and private organizations, and scholars and experts in all of the activities related to the preservation, management, research, and interpretation of cultural and environmental heritage sites. The model is usually designed around interchangeable roles, shared responsibility, and a mutual trust among participants.

"Trust" is certainly the operative word here, and it is in this arena of trust that most museum people have some work to do. Online conversations in the library community about the notion of "radical trust" have prompted some of us in museums to think more clearly about our potential relationships with visitors, particularly those of us who are looking for new "emergent systems" for our museums.

> We can only build emergent systems if we have radical trust. With an emergent system, we build something without setting in stone what it will be or trying to control all that it will be. We allow and encourage participants to shape and sculpt and be co-creators of the system. We don't have a million customers/users/patrons . . . we have a million participants and co-creators. Radical trust is about trusting the community. We know that abuse can happen, but we trust (radically) that the community and participation will work.[1]

As museum professionals struggle to create experiences that are worthy of public attention (and funds), we often think we have to do it all by ourselves. But visitors can also be co-developers of exhibits and programs, bringing fresh and surprising meaning to the museum experience through their opinions, comments, questions, and creations.

Some colleagues may deem naïve my proposition that we think of our visitors as partners, but I am convinced that we have no choice. If museums don't embrace the unprecedented technological and social changes taking place all around us—changes that have resulted in a public that expects to participate in the creation of personalized and customized experiences—we will face a time when our museums are irrelevant, marginalized, and ultimately impoverished. While the rest of the world engages in the dynamic exchange along what was only recently called the "information superhighway," we will find ourselves on a lonely dead-end street.

Portions of this article are based on an earlier piece by this author in the *Journal of Museum Education* 28, no. 3 (Fall 2003) and are used with permission of the Museum Education Roundtable.

NOTE

1. Darlene Fichter, Blog on the Side, "Web 2.0, Library 2.0 and Radical Trust: A First Take," April 2, 2006.

Crafting the Call

Kathleen McLean and Wendy Pollock

Soliciting meaningful visitor participation and commentary requires planning and attention to detail. The success of most visitor-response elements lies in how carefully museum staff consider what they want to ask and why, how comfortable and easy they make it for visitors to respond, and how well the affordances of the solicitation device support its primary purpose.

The choice of media and methods is wide and growing, and some are better than others in eliciting particular types of response. All are dependent to some degree upon the specific content and overall environment of the exhibition. When selecting the appropriate medium and method, the following contextual, organizational, and physical conditions are worth consideration:

Location

- **In general public areas**—Guest books have long been employed by museums, installed at the beginning or end of an exhibition, at the museum entrance, or even in a public hallway. Guest books usually elicit "we were here" kinds of responses, often with expressions of gratitude and with an occasional suggestion for improvement.[1]
- **In exhibitions**—Comment devices situated within exhibitions and focused on specific content, on the other hand, invite visitors to process their responses and contribute more in-depth ideas, reflections, and opinions. The choice of location within an exhibition is also an important factor.
- **Beyond museum walls**—These days, visitors can comment via web sites from locations even more remote than the museum's entrance. As more museums experiment with soliciting "distant" responses, it would be interesting to assess whether and in what ways these differ from responses authored within the exhibition.

Physical affordances

- **Seating**—A place to sit invites visitors to slow down and reflect. At the U.S. Holocaust Memorial Museum in Washington, D.C., for example, armchairs situated in a quiet corner provide a comforting setting for remembering and reflecting at length.

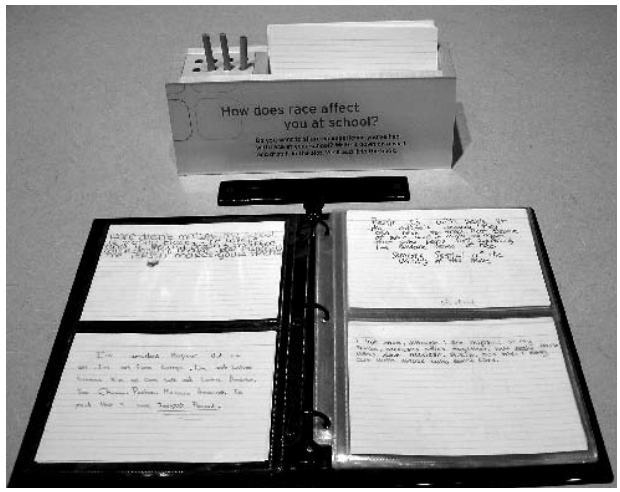
New York City's Tribute WTC Visitor Center (adjacent to the World Trade Center site) encourages visitors to express their thoughts and emotions after experiencing the powerful galleries. The staff selects cards for display from the hundreds received each week.

- **Horizontal display**—Display on a horizontal surface, such as at a desk or in a book, may suggest that the contents are worth reading closely—and a thoughtful response is expected.
- **Vertical display**—Message boards on a wall with loose cards and sheets attached are currently the most widely used technique. Unlike comment books, with their journal-like feel, cards displayed on boards suggest a more public arena that can shape the type and quality of message expressed. Phaedra Livingstone's analysis of responses to the Ontario Science Centre's *A Question of Truth* (pages XX–XX) suggests that people may be likelier to contribute in this medium than in one that doesn't allow them to scan others' comments first.
- **Spatially unrestricted**—Journals and notebooks suggest a narrative and expository style of commentary that allows visitors to use as much space as they need; some will fill several pages with detailed accounts, stories, and reflections.
- **Spatially confined**—Cards, small pieces of paper, and Post-it notes usually elicit brief comments and ideas. Even in a notebook or binder, sheets of paper may be preprinted with lines that suggest the maximum length of a comment.
- **Limited in time**—Audio and video recording devices usually set limits on how long a statement can be—a few minutes, in general. A countdown device can help users to control the pace and timing of their commentary.

- **By hand**—Handwritten responses are the most straightforward and low-tech of all visitor feedback devices. In her article about the Oakland Museum's exhibition *What's Going On* (pages XX –XX), Barbara Henry describes the size and energy of some of the handwritten (and drawn) reflections on the Vietnam war that give "texture and character to their many voices." The quality of writing materials also appears to be associated with quality of response, as Richard Toon's study of the *Psychology* exhibition suggests (pages XX–XX).
- **Digital texts**—Comments contributed by computer, whether locally or remotely, are more or less standardized in look. But as technologies rapidly change and user interfaces become more accessible, digital contributions are becoming more diverse and customized in look and feel.

Unedited or moderated

- **Message board for Post-it notes**—The use of Post-it notes indicates to visitors that they can post their own messages without museum edits. Staff may remove notes after the fact, eliminating inappropriate remarks or making room for new comments, but visitors are clearly invited to put their comments on display, at least for a period of time.
- **Message board for loose cards and sheets**—This may be moderated by staff (with visitors depositing their comments into a box of some kind); or visitors may be invited to post their comments directly, which enables them to create juxtapositions in what Jenny Sayre Ramberg, writing of the Monterey Bay Aquarium's talkback exhibits (pages XX–XX), calls "a sort of conversation."
- **Binders with loose sheets or sleeves**—For museums that want to oversee and "curate" visitor commentary, loose-leaf binders and books allow staff to cull and select specific entries.



Visitor comment binder in the Science Museum of Minnesota's exhibition *RACE: Are We So Different?*

- **Bound books**—Those museums prepared to accept the occasional off-topic remark might use bound books, as in the *Memory* exhibition's Earliest Memories component described by Michael Pearce (pages XX–XX). A bound book sends a message of trust.
- **Blogs and other online user-generated content**—The culture in the online realm is tending toward unmoderated, but site owners need to be aware of legal issues—and prepared for the online equivalent of off-topic and offensive talk-backs.

Anonymity or disclosure

- **Signed/unsigned**—Some people invite contributors to identify themselves, as in the Art Gallery of Ontario's cards with their invitation to "Please describe yourself"—but leaving a name is usually considered optional (page XX).
- **Audiotaped**—Audio recordings submitted by visitors may be anonymous, but can reveal personality through the quality of the voice.
- **Videotaped**—The most revealing medium, video discloses not only visitors' thoughts and feelings, but also their identity. Participants generally are asked to review their recordings and choose to either delete or share them. As Wendy Clarke points out, being able to erase their "Love Tapes" recordings encouraged people to go ahead and take a risk (pages XX–XX). (In some cases, like the *Wild Music* exhibition's Musical Memories kiosk, visitors can contribute the recording to a scientific research project after giving informed consent.)

In the traveling exhibition *Massive Change*, organized by the Vancouver Art Gallery and designed by Bruce Mao, visitors could vote on a variety of social issues by placing slips of paper in transparent boxes.

Contexts for Focusing Engagement

- **Voting pro or con**—One of the simplest ways to elicit response is to invite visitors to vote on an issue presented in the exhibition. It's a good idea to design the elements so that visitors can see the votes of others and compare them to their own. This may be even more important in exhibitions with charged or contested subject matter, since voting elements can acknowledge diversity and disagreement. But a simple "yes/no" will naturally suggest a simple, binary choice.
- **Open-ended**—Blank comment books may invite those inclined to write at length to do so. On the other hand, as Richard Toon notes, a completely blank page may elicit a higher percentage of off-topic comments than one headed even by a simple suggestion like "Please tell us what you made of the psychology exhibits" (page X).
- **Response to expert views**—Framing issues and questions helps visitors focus their response. As Barbara Costa explains (pages XX–XX), the Forum area at the Museum of Science, Boston provides background and expert opinions on panels and in videos, which visitors are encouraged to consider before recording their own opinions.
- **Staff perspectives as modeling behavior**—At the Monterey Bay Aquarium, another approach, described by Jenny Sayre Ramberg (page XX), is to seed the area with comments from staff.
- **Entering into a scenario/role playing**—In the Science Museum of Minnesota's *RACE* exhibition, visitors can sit down at what looks like a high school cafeteria table and watch a video of students talking, then write their own reflections.

Making things

Many of the projects described in this book focus on soliciting visitor commentary—on thoughts, ideas, and questions expressed primarily through words. But a growing number of museums are opening their galleries and exhibitions to other forms of visitor expression. While the notion of encouraging visitors to leave their creative mark in museum galleries is not exactly new—think of all the children's museums where kids can add their handprints to an exhibit wall, or science centers where people leave traces of their activity—the practice of making room in our galleries and exhibit halls for authentic creative action by visitors offers unlimited new possibilities. One of the most

In the exhibition *HERE IS NEW YORK: A Democracy of Photographs*, the public submitted images related to September 11, 2001. All were scanned and digitally printed the same size, with only numbers for identification. This exhibition attested to the potential power and depth of public-generated content.

democratic and diverse of these recent efforts is the exhibition *In Your Face* at the Art Gallery of Ontario. Gillian McIntyre, one of the project designers, eloquently describes the museum's call and the extraordinary public response (pages XX–XX).

The other half of the picture

Designing to encourage visitor contribution is only half the picture—making sure that other visitors have access to the visitor-generated materials is arguably just as important. As we move toward creating environments in which visitors share in contributing content, perhaps our most important effort should be focused on facilitating exchange—and getting out of the way.

NOTE

1. Sharon Macdonald, "Accessing Audiences: Visiting Visitor Books," *Museum and Society*, 3, no. 3 (November 2005): 119–136.

Why use visitor-response elements in exhibitions?

The articles that follow describe many reasons for incorporating visitor-response elements into exhibitions. They can:

- validate visitors' experiences, knowledge, and emotions
- support visitors in personalizing and integrating their exhibition experiences
- redress a perceived imbalance in the content of an exhibition
- enable the institution to engage with a wider audience
- expose visitors and museum staff to diverse perspectives
- open up possibilities for dialogue and exchange
- extend participation beyond a programmatic event
- reinforce visitors' intentions to take action
- help people find others with common interests
- provide a constructive way for a community to respond to a contentious or emotional issue
- deepen museum staff's understanding of visitors' experiences
- honor public creativity.

Talking Back

Janet A. Kamien

The Boston Children's Museum was not the first museum to engage in organized methods of direct visitor feedback, but we were surely in the game early. It was an obvious step. We believed in being "client centered," so finding out what the client needed, wanted, or thought about our museum was important to us. This was in the late 1960s and early '70s. Visitor research, as we now understand it, barely existed.

In our beginning use of "talk-backs," as we called them, we simply cut to the chase and asked people what they thought about the Children's Museum. We posted many of these comments, both good and bad, and the suggestions for improvements or new exhibits and programs for other visitors to see.

We eventually began to incorporate talk-backs into specific exhibitions. One of the first of these was for a project called *Lito the Shoeshine Boy*. This 1974 exhibition was based on a photo-documentary-style children's book about a day in the life of a poor, abandoned street boy in Guatemala. A maze-like space, stage-set-style rooms and large black-and-white photos and text from the book suggested the environments and activities of Lito's everyday life, as he made it more or less on his own, with little adult help and no schooling.

Visitors were asked to consider this story and write to us about it on notepaper that could be tacked up on a bulletin board. And write they did, about their sorrow for this boy, with thanks for telling his story, or appalled that we were telling such a sad story in a "fun" place. There were also political opinions about how the Litos of the world had been created—one writer blamed the United Fruit Company and included a snide suggestion about our possible connection to those scoundrels!

We knew that this exhibition would raise a few eyebrows, and we wanted feedback from our visitors.

Our motives may have been a bit disingenuous. We knew that this exhibition would raise a few eyebrows, and we wanted feedback about this risk from our visitors. We suspected that visitors who opposed our installation for whatever reason would feel a bit more forgiving of us if offered the chance to tell us so in public. We also thought that visitors who were emotionally touched by the exhibition would be grateful for a place to reveal their feelings.

Thus was born the notion of the talk-back as a Boston Children's Museum device that might do three things:

- inform us, the producers, if our products were found to be useful and enjoyable to the people for whom we had produced them;
- provide a place for people to vent strongly felt emotions or opinions that the exhibition may have evoked;

- mitigate controversy evoked by some of our possibly risky undertakings by providing a public forum for naysayers to "tell us off."

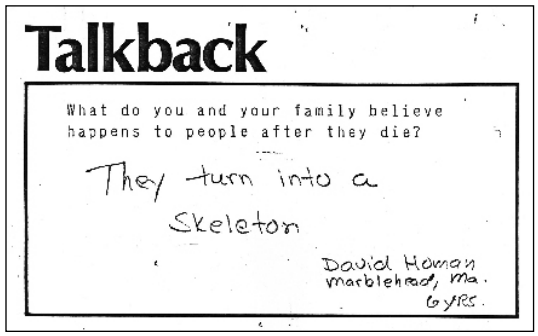
Subsequent experiments would bear out the utility of all three of these suppositions and eventually add two others:

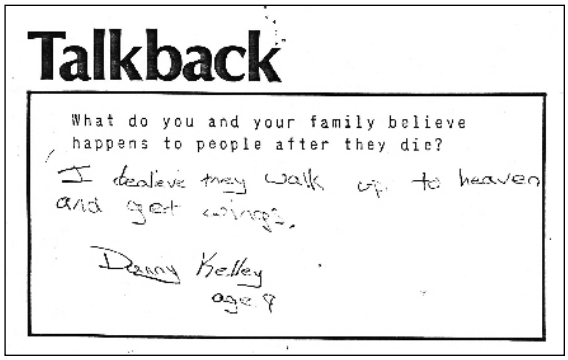
- provide a medium for visitors to talk to each other;
- provide a way for visitors to become part of the exhibit by continually adding to its content.

If ever an exhibition cried out for the use of talk-backs for all these purposes, it was the 1986 *Endings: An Exhibit about Death and Loss*. We designed three talk-backs for the 5,000-square-foot space. (As developer of this exhibition, I should have known to have made it four . . . but more about that later.)

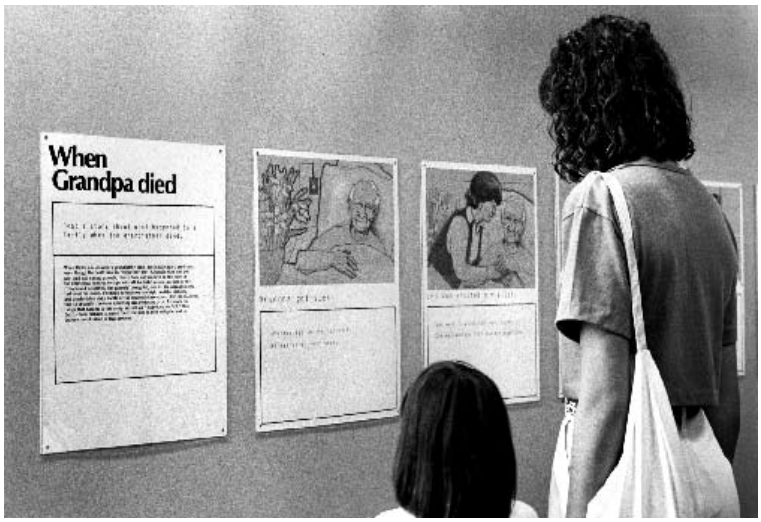
The first component asked visitors if they had been named for anyone. We expected a light response, mostly citing grandparents, aunts, and uncles. The response was light, but surprisingly featured many examples of children named for soldiers—kin and friends—lost in the Vietnam War. This was fascinating both to us and our visitors.

The second component asked for opinions about the afterlife. After describing a variety of beliefs (unattached to a specific religion), including the notion that there is none, visitors were asked, "What do you and your family believe happens to people after they die?" Two of my personal favorites were, "My family believes in heaven, but I'm not so sure," and "Our soils [sic] fly up to heaven," complete with an illustration thereof.





The third component should have been two: It asked visitors to tell us what they thought of the exhibition or to share an experience they had had with death. I think some visitors were confused by this double question, though most chose to answer one or the other. Visitors answering the first question were all over the map, often responding to other people's postings. Some thought it brilliant, others that it was inappropriate for a children's museum, or that we should read our New Testaments—then we'd know that there was no such thing as death! Some younger visitors wanted to tell us that they thought the material was OK for them (9- or 10-year-olds), but they feared it was inappropriate for "younger" visitors.



In the 1986 exhibition *Endings*, an invitation to share an experience with death elicited long, heartfelt responses that were in many ways as engaging as the exhibition itself.

Answers to the second question were sometimes poignant, sometimes funny, and sometimes so personal they weren't posted, but placed in the box we provided. Many of these were written by adults. Many were very long and heartfelt. One often had the sense that some of these visitors had been looking for a way to tell someone about their feelings for a very long time. In many ways, the content provided by our visitors was just as engaging as the exhibition itself.

Talk-back boards were used with equal effect and poignancy in an exhibition called *Families*, about the love and commitment of members of nontraditional families to each other. Here again, we, and our visitors, heard how grateful kids felt that their own particular type of family had been recognized, although some adults took issue with the appropriateness of the presentation of a homosexual couple in a children's museum.

In the mid-1980s, Michael Spock and I took our love of this device with us to the Field Museum of Natural History in Chicago. One of its first uses there was to help us and our visitors focus on an old, miniature diorama called "Morning Star," in the Native American Hall. In it, a young woman was being sacrificed by a group of men. Label copy explained that this was an annual event meant to please the gods. Though

Visitors of every persuasion were eager to state their opinions and show what side they were on.

the diorama had sat unremarked upon for 30 years or more, a white feminist visitor was so outraged by it that she wrote a scathing letter to us. We consulted a Pawnee eldress, and she too wrote a letter explaining that this really did happen, that they weren't proud of it, but that there was no reason not to talk about it. These two letters were posted in a talk-back, in which other visitors could state their opinions. Should we get rid of this exhibit, we asked, or keep it? In the meantime, staff research revealed many flaws in both the presentation and the label copy. Based on visitor commentary over a long period, we decided to keep the diorama and correct it. It became a less lurid presentation and more accurate—for instance, the whole village had participated, not just a group of overexcited-looking men.

Other talk-backs were used, especially in *Life Over Time*, the Field Museum's large exhibition about evolution and the history of life on Earth. These talk-backs addressed some sticky issues that would be seen by some to have religious implications. One asked (in the context of the Urey-Miller experiment[1] of the 1950s and a book of creation stories from all over the world) what visitors thought about how life began on Earth. Responses to this ranged from "kill all abortion doctors" to "Darwin is God" to "evolution is a glove on the hand of God." None of these, of course, addressed the question we asked, but all made it clear that visitors of every persuasion were eager to state their opinions and show what side they were on or, like the last, that they could see both sides.

One important lesson learned at the Field Museum was in *Animal Kingdom*. An early talk-back in that conservation-minded exhibition asked, "What can *you* do to help the environment?" and provided some prompts, such as recycling, or saving gas or electricity. To this, visitors replied with observations like "Charlie loves Sally" and a variety of four-letter words. Why? Because they knew they were being set up. We weren't really asking them what they thought, we just wanted them to parrot something back to us, and they refused. We took it out.

Now, a few words about technique. Readers will have noticed that every example uses paper and pencil and not computers. The biggest innovation seems to be that of the Post-it. (And how glad I am of it—no more worrying about little ones with thumbtacks or pushpins!) Though computers were considered at the Field Museum, we eventually decided in each case to stick to the old technique. There are a couple of reasons. One is that it is much easier (and easier for more people at one time) to scan the comments of others or to add their own. Another reason is that people can place their comments in relationship to others or to graphics that are supporting an idea.

This is not to say that the variety of uses of computers and video kiosks for feedback in many institutions doesn't work fine. In addition to having innate appeal for

some visitors, computers also offer the institution a simple way to keep all the comments, instead of having shoeboxes of "stickies" floating around. But it is also important to remember that no matter how consistently or scientifically talk-backs are collected, they are no replacement for actual visitor research, and that collecting talk-backs will not yield a reliable database for analysis.

At the Field Museum, we also experimented with the use of a "comment book" at the end of *Daniel's Story*, a traveling exhibition about the Holocaust. This is a perfectly good way to allow for visitor feedback. But even using paper and pencil, it shares some of the aspects of computer feedback, in that only one person can use it at a time, and it's more difficult for other visitors to review what others have written or to respond in a direct way to the comments of others.

It is for these reasons that the single question "talk-back" seems to me to be the most useful format. It becomes a temperature-taking device, a venting mechanism, a dialogue enhancer, and an integral part of the exhibition content. All in all, talk-backs, by their very participatory nature, help to turn every exhibit they are in to one of dynamic daily change and thereby change the tenor of each installation for the better.

JANET A. KAMIEN was at the Boston Children's Museum from 1972 to 1986 and the Field Museum from 1986 to 1996. She is an independent museum consultant and a member of the Museum Group.
She would like to thank Elaine Heumann Gurian and Michael Spock for their reviews.

Adapted from an article that appeared in the *Journal of Museum Education* 28, no. 3 (Fall 2003). Reprinted with permission of the Museum Education Roundtable. (www.mer-online.org).

NOTE

1. In this stunning experiment, the combination of water, hydrogen, methane, ammonia, and an electrical spark yielded the creation of three life-essential amino acids in a week's time, suggesting that life on Earth could have begun through a happy, but accidental combination of common materials.

The Power of the Pencil: Renegotiating the Museum-Visitor Relationship through Discussion Exhibits at the Science Museum, London

Ben Gammon and Xerxes Mazda

Visiting an exhibition about science and technology is generally a process of one-way communication—the museum speaking to the visitor. In contrast, the idea of allowing visitors to express and record their opinions is a departure, at least for museums of science. To include visitor comments in the exhibition and to give them status equivalent to the material produced by the museum is an even greater break with tradition.

An exhibit that enables visitors to express their opinions would seem to hold much potential as a novel interpretative tool. It involves the visitors and draws them into complex discussion far more successfully than static text, objects, or even interactive exhibits. This is useful because displays about modern science increasingly attempt to cover complex, unresolved issues. These topics do not easily lend themselves to the use of traditional exhibition media.

Although the use of such visitor feedback exhibits is on the increase, there has been surprisingly little assessment of how well they fulfill the objectives of either the museum or the visitors. Only a handful of studies have been published that explore the background and the effectiveness of this method of interpretation.[1]

This paper is concerned with an analysis of one method of garnering visitor feedback—discussion exhibits.[2] It begins by defining a discussion exhibit and describing the experimental use of this kind of exhibit in the Science Museum, London. The next section critically examines the motivations of the museum in providing discussion exhibits and the motivations of the visitor when using them. From this analysis we suggest that, although discussion exhibits can be effective and engaging, there are three possible pitfalls that may compromise their success.

What is a discussion exhibit?

A discussion exhibit is defined as an area where visitors can write their opinions or questions about issues covered by the surrounding exhibition. Visitors are prompted by a series of open-ended questions, for example, "What do you think about the Big Bang as a theory of the origin of the universe?" The visitors write comments on cards or sheets of paper and post their responses into a ballot box. Museum staff periodically empty the box and screen the comments to remove those that are irrelevant, obscene,

or potentially libelous. The remaining comments are then typed, laminated, and added to the display of previous comments left by visitors. These discussion exhibits are never free-standing, but always form part of larger exhibitions. This definition of discussion exhibits excludes examples in which visitors are asked to select answers from a predetermined list or to vote on a particular issue. Nor does this definition include comments books, where visitors are asked to comment on their visit to the museum.

Discussion exhibits at the Science Museum, London

Since 1996, the Science Museum has been using discussion exhibits with varying success.[3] In order to better understand the possible pitfalls of such exhibits, the museum recently began a program of research into their use. Discussion exhibits were developed as part of a series of temporary exhibitions. Each exhibition covered a contemporary issue in science, technology, or medicine and was aimed at a nonspecialist audience aged 12 and above. The discussion exhibits were evaluated to determine how visitors were reacting to them and to assess what the project teams were hoping to achieve by including them in the exhibition.

This paper will focus on discussion exhibits from the following three exhibitions:

1. *Future Foods?* looked at the science and issues behind genetically modified food.
2. *Join the Great Fat Debate* aimed to introduce visitors to the issues around Olestra—a manufactured substitute for fat.
3. *The Big Bang* covered the theory of the Big Bang, and the research that led to that theory.[4]

What motivated the museum to use discussion exhibits?

The second part of this paper explores the exhibit developers' expectations of the discussion exhibits. This was researched through interviewing members of the project teams for each exhibition, and analyzing internal museum documents. The research found that museum staff believe discussion exhibits encourage visitors to engage with what is perceived to be difficult material.

An exhibit developer has available a range of techniques for presenting science to the public. However, it is extremely difficult to cover predominantly issues-based subjects using traditional exhibition media. Many issues in contemporary science are abstract and do not easily lend themselves to the use of interactives nor to more traditional object-based displays. There is a danger that such exhibitions can become text heavy, with little appeal for the visitor. Previous experience of trying to develop issues-based exhibitions proved to be highly unpopular with visitors. For example, an exhibition about the issues behind screening for genetic illnesses was described by visitors to be "uninspiring" and "drab and dreary." As one visitor summarized: "If you had

It is not only scientists who have a valid opinion about science and technology.

children with you then you would [walk by] because you couldn't keep them still while you sat and read. There's nothing to occupy them."[5]

The use of discussion exhibits is often seen as a way of getting around these problems. For example, the *Future Foods?* project team felt that "previous exhibitions have shown that a comments box is a successful way of allowing visitors the chance to explore their feelings about a variety of issues."

Similarly, *Join the Great Fat Debate* was developed "so visitors could directly participate in an exhibition about a chemical subject," because the exhibition developers felt that "it is not only scientists who have a valid opinion about science and technology."

The developers of the *Big Bang* exhibition were explicit in their belief that "the Big Bang theory raised contentious issues and some people would hold quite strong beliefs that they would want to be able to communicate. . . . So we hoped that having a feedback book would prevent visitors from feeling any frustration at not seeing their personal views represented in the exhibition."[6]

Evaluation of the discussion exhibits confirmed that the project team's wishes were met. For example, observation studies showed that 52 percent of the visitors to *Join the Great Fat Debate* used the discussion exhibit by reading and/or writing comments. When visitors to this exhibition were interviewed about their reaction to the idea of developing more discussion exhibits, there was an overwhelmingly positive response.

> Go for it—it would give the public perspective.
>
> People should be prompted to give an opinion rather than go along with it without thinking.

A series of focus groups and in-depth interviews were conducted to assess visitors' reactions to the *Future Foods?* exhibition. On the whole visitors responded very favorably to the discussion exhibit. As stated in the final report, "The visitors' comments book was seen in a very positive light. In fact for many it provided an important role in providing balance."

Some of the most convincing evidence for the effectiveness of discussion exhibits is in the number and quality of responses that were left by visitors. Over a three-month period, more than 2,000 comments were left in each of the three exhibitions. In many cases the quality and length of these comments illustrated the care and time which visitors were giving to their responses. The following two examples are typical of many comments that were left:

> I simply don't trust scientists (sorry!) to determine the future composition of my food. There is increasing evidence to link between certain diseases, notably cancer, and sprays, insecticides and other chemicals. At present we simply do not

know the long-term genetic (human) implications of genetic tampering. I should vastly prefer my food to be as nature engineered it, spots and all!—at least then I know and can be responsible for what I eat, rather than having other people engineer it for me. The future of our food is terrifying, and particularly the fact that we have now reached a stage where whatever we buy, we cannot be sure whether or not it has been interfered with.

There's enough fresh fruit and vegetables on the market. Adding extra artificial foods can only bring long-term problems to society's diets. I feel that the money that has been spent on researching such 'new' foods is better spent on promoting a healthy, natural diet, with a moderate amount of fat.

Similar results have been found for discussion exhibits in other museums. For example, the Share Your Reactions cards in the Art Gallery of Ontario received around 5,000 responses over a nine-month period. The quality of these comments was also deemed to be very high: "The range of responses have often left me quite speechless because of their power and mystery and none of them really reflects the kind of insight into the art experience that the gallery itself could articulate."[7]

Although the desire to have an effective interpretative tool was found to be the major motivation for exhibition teams, the Science Museum was also keen to explore the use of discussion exhibits as a way of catalyzing debate on galleries without the use of

London's Dana Centre, a separate, adults-only venue opened by the Science Museum in November 2003, hosts evening performances and discussion groups on contemporary science topics.

expensive staff moderation. This is part of the Science Museum's aim to become a center for public debate on issues in contemporary science and technology.

It is interesting to ask how far discussion exhibits can fulfill this role. An analysis of the responses left by visitors showed that real debates were emerging. The following are four consecutive responses left in the *Big Bang* discussion exhibit. In this sequence, visitors refer back to previous comments, which gives the impression of a dialogue.

> A theory is just a theory. We cannot be sure if it is reality. As long as there are no experiences made, that speak against it, it has to be taken for true. To me, the Big Bang appears to be a quite good explanation. I hope it is true. If it is, we have done one more step to wisdom. But no-one will ever know!"
>
> The validity of this highly contentious theory is proved by the exhibit—simplistic, naive, lacking in proofs. Just look at the rest of the museum for inspiration! Allah, creation!
>
> And the Koran has proof in it does it? That's a big NO.
>
> But this exhibition SAYS Big Bang is a theory! And it says about the 'proofs' to back it up. For example the background radiation and the amount of helium. I don't think it's a contentious theory at all, it seems to have more evidence than steady state or Creationist views of the Universe. I know what I'd rather believe.

In addition, the *Future Foods?* focus group displayed considerable support for the idea of extending the discussion element by having feedback from experts as well as visitors. Comments to this effect were even written by visitors to the exhibition: "It would be a great idea to answer the questions in this exposition." Although the practicalities of regular expert response to visitors' comments are awesome, it is something that the Science Museum will attempt to do in the future.

Visitors' motivation to write

The third part of this paper looks at visitors' motivations to take part in discussion exhibits—both to read and to write comments. Three key motives were found for visitors to write comments.

1. AN OUTLET FOR ANGER

Visitors seemed to be using the discussion exhibit as an outlet for their anger and frustration. Many of the comments showed real passion, with words written in capitals or heavily underlined. The specific points raised in the exhibition appeared to have acted as a catalyst for visitors to express opinions drawn from their own knowledge, experience, and prejudices. The following two examples illustrate this.

> Where is the democracy?! It is the consumers who do not benefit. The companies who produce it are there to make a profit! All genetically engineered food should be banned or at the very least labelled in shops so we are not hoodwinked into buying it.
>
> Olestra adds no calories to the diet. It cannot be used by the body. How much has it cost to develop and how much profit do the manufacturers want to get back from it? Twenty-five years of testing is an awful lot of investment. Why do we need it? Answer: we don't, but someone thinks they can profit from it.

2. A WISH TO CAUSE CHANGE

Visitors seem to be motivated by the belief that their comments would be read by manufacturers and policy makers. This belief is not particularly surprising, because almost the only time public opinion is sought is in market research. A *Future Foods?* focus group participant voiced the belief of many visitors when she said:

> I think it is a very controversial topic and a lot of people are very upset about it. It stirs emotions. So I think they're trying to find out what people think, and then they can use that to focus their marketing strategy to counteract, because after all they're selling a product of some sort.

3. THE GRAFFITI EFFECT

The desire to scribble graffiti appears to be a powerful motivation for visitors to use the discussion exhibit. Although many of the examples shown so far have been of a high quality, it would be wrong to imply that this was always the case. On the contrary, many of the comments are best described as graffiti. Of the 2,259 comments left in the *Future Foods?* exhibition, only 34 percent were deemed relevant to the exhibition, while for *Join the Great Fat Debate*, the percentage was 22 percent. The largest proportion of "graffiti" comments comprised scribbles, with a smaller amount of obscenities and general views about the museum.

Many of the comments that were considered relevant and were displayed in the exhibition comprised very short sentences, with only the most tenuous link to the question that was asked. The following examples, taken from *Join the Great Fat Debate*, in response to the question "What do you think about olestra?" amply illustrate this point: "Eat it if it tastes nice." "Olestra is super-fat man." "What is olestra?" "Gemma likes it." "Chocolate is my favourite food."

Visitors' motivation to read

It was also possible to identify three motives for visitors to read the comments left by previous visitors.

1. LANGUAGE

The first motive to read comments concerns the style and language used by visitors when expressing themselves. The comments make compelling reading. Why is this so? One possible explanation lies in the emotive language that visitors use, as illustrated by these examples:

> I am a molecular biologist and GM food scares me to death.

> No problem with genetic mods or clones. If we had let religion have its way we'd still be in the caves.

> GE is not an extension of existing selective breading. GE is clumsy and dirty. In some processes tiny particles of tungsten are fired into the chromosomes of 'host cells' [. . .] its like firing a cannonball at a butterfly with a maggot and an appleseed attached and hoping it sticks in the eyeball and not the wing! Stop it you silly people.

The visitor who wrote this third comment certainly had a good working knowledge of genetic engineering, and yet, unlike explanations written by the museum, the style of writing is very emotive, expressive, and ultimately very readable. It is quite conceivable that many of the points made by this visitor could have been made by the Science Museum, but the language would be more measured, balanced, and neutral.

2. BALANCE

The second reason why visitors read the comments left by other visitors is concerned with bias. Visitors felt the *Future Foods?* exhibition was biased in favor of genetically modified food.[8] For example:

> This exhibition boldly states that risk assessments examine all potential effects that GM could have on our health and environment then goes on to list impressive sounding committees. This is a ridiculous and scientifically inaccurate claim. It is impossible to assess how a gene pool will behave—just as nobody foresaw the impact of introducing new species in Australia or New Zealand.

The book of comments was valued by visitors as an essential component of the exhibition, as it was perceived as a method of redressing the imbalance. As one focus group participant commented, "It was interesting that in the comments book it was all the opposite way, so maybe there was some balance there." Visitors even wrote comments to this effect in the book: "This seems to me to be a very agribusiness dominated exhibition. The only doubts are ours, the punters, on these slips of paper."

3. A NOVEL POINT OF VIEW

Finally, the discussion exhibits were valued by visitors as they allowed issues to be tackled from the point of view of the visitor rather than that of a scientist, exhibit developer, or manufacturer.

To summarize, museums see discussion exhibits as valuable components of exhibitions because they provide effective methods of interpretation that involve visitors, encouraging them to engage with the complex issues in modern science.

Visitors, on the other hand, are motivated to write their comments by a desire to vent their anger and register their concern over an aspect of the exhibition material. Some visitors may take this further, believing that their comments could affect the technology under discussion, and yet other visitors respond to the same impulse that drives them to add to graffiti in a public place. The resulting collection of visitor comments makes compelling reading owing to its emotive language, the way it addresses visitors' concerns rather than those of the exhibit developer, and the way it can make up for perceived bias in the exhibition.

So, on the surface, there appears to be a good match between the Science Museum's primary expectations and the visitors' experiences. The museum wants the visitor to engage with complex ideas expressed in the exhibition, and the visitor certainly finds the discussion exhibit engaging. Yet it is necessary to sound a note of caution. This research has identified some potential problems which need to be addressed. We suggest that both the museum and the visitor need to be aware of the following three potential delusions.

The delusion of universal application

It is tempting for exhibit developers to believe that discussion exhibits could work for all subjects. Yet having teased out the visitors' motivations, it becomes clear that this is not the case. Discussion exhibits work best on subjects that visitors feel strongly about—those covering controversial and emotive issues. The more detached the visitor feels from an issue, the weaker become the anger and the desire to effect change, and there is a danger that the primary visitor motive to contribute becomes the graffiti effect. By its nature this would make the written comments less compelling to read, thereby downgrading the degree of visitor interaction with the discussion exhibit as a whole.

Discussion exhibits work best on subjects that visitors feel strongly about—those covering controversial and emotive issues.

This has indeed been the case in other discussion exhibits tried at the Science Museum. For example, in the exhibition *Bucky Balls*, a discussion exhibit was included that posed the question "What do you think Bucky Balls might be used for in the future?"[9] There was no compelling motivation for visitors to answer this question, as evidenced by the fact that less than 20 comments were left over the five months the exhibition was open.

The delusion of market research

To all intents and purposes, the discussion exhibit looks to a visitor like a tool of market research. This paper has already presented evidence that the visitor believes the data is being collected by the Science Museum on behalf of manufacturers.

This illusion has several ramifications. First, the museum is in danger of compromising its neutrality. How can visitors believe the museum is neutral if they see that the museum is acting as an agent for manufacturers by acquiring commercially valuable market information?

Second, there is a danger that the visitor is being deceived. If visitors believe that they are indirectly shaping technologies because the people who can make a difference will read their comments, then what will these same visitors think if they find out that their comments are instead kept in a file in the museum archives? This probably over-exaggerates the case. It would certainly be very difficult for a museum to hand comments over to a manufacturer without compromising the museum's position of neutrality. However, during the course of an exhibition the comments are displayed for all to see. Both the manufacturer and groups representing other sides of the debate are likely to visit the museum in order to investigate the range of concerns that people would have.

The delusion of lay discussion

Who contributes to discussion exhibits? Is it the lay public, people with a specialist knowledge, or representatives of the manufacturers or pressure groups? It is probably all of these, but importantly there is no way of telling, as all comments are anonymous. Without evidence to the contrary, museums and their visitors presume that the comments are those of the general public. What is to stop manufacturers or pressure groups from anonymously adding comments in an organized fashion? Admittedly it seems a lot of effort to go to when discussion exhibits currently have such a low profile, and it is unlikely that either *Future Foods?* or *Join the Great Fat Debate* were targeted in this fashion. However, if ever discussion exhibits gain a higher profile, they are likely to be highjacked by organizations with financial or moral interests in the subject matter, and both the museum and visitors will be deluded.

Conclusions

The above research has convinced us that discussion exhibits are a popular, cheap, and effective interpretative tool for engaging visitors in debates about emotional and controversial scientific issues. Using the findings of the research, a second generation of these exhibits is being developed for use in the galleries of the new Wellcome Wing at the Science Museum, London. Taking a wider view, there is no doubt that discussion exhibits will increasingly be used in museums and galleries, whether they are concerned with science or the arts.

The work outlined above has exposed some of the ground rules and pitfalls of discussion exhibits. As these exhibits increasingly play a useful role in museums of modern science, project teams should keep a firm eye on the three delusions in an attempt to minimize their impact. With this caveat, we believe discussion exhibits have a bright future in renegotiating the traditional relationship between museums and their visitors.

NOTES

1. For example, see Douglas Worts, "Gallery Enhancement: Forging a New Partnership with the Public," *Visitor Studies: Theory, Research, and Practice* 6 (Jacksonville, Alabama: Visitor Studies Association, 1993): 176–197.

2. Other forms of visitor feedback would include comments books, video stations, audio recording, public debates, gallery drama, consensus conferences, and various methods of voting.

3. An early example of feedback in the Science Museum, London, was mentioned in the Annual Report for 1937. A temporary exhibition about electric illumination was attended by about a quarter of a million people over five months. The report states that "by means of an operable exhibit, 147,272 persons recorded opinions about the amount of light desirable for comfortable reading, and a large number recorded their decisions about a heterochromatic photometry experiment. The Museum had been asked to preserve the results of these tests as a basis from which important conclusions were to be drawn—an example of how the Science Museum can fulfill a useful function where mass statistics are required as the material of scientific investigation. The co-operation of the public was marked by the care and intelligent interest which the majority displayed."

4. The *Big Bang* discussion exhibit differed from other discussion exhibits in that visitors wrote their contributions on a sheet of paper bound into the same flip-book as the typed-up comments of previous days. It was therefore much more like a traditional comments book.

5. *Genetic Choices?* was a temporary exhibition about the issues behind screening for inherited diseases.

6. Sarah Hunt, personal communication (1998).

7. Douglas Worts, "Gallery Enhancement," op cit., 180. See also pages XX–XX in this book.

8. This view was not unusual—see Les Levidow, "Domesticating Biotechnology: How London's Science Museum Has Framed Controversy," *European Association for the Study of Science and Technology Review* 17, no. 1 (1998): 3–6.

9. *Bucky Balls* aimed to introduce visitors to the science and potential applications of Bucky Balls, a recently discovered form of carbon.

EVALUATION REPORTS CITED INCLUDE:

Genetic Choices?—Results of a visitor evaluation, an unpublished internal Science Museum report produced by Creative Research Ltd. (1997).

Future Foods?—Visitor Comments, an unpublished internal Science Museum report, ed. Nicola Perrin (1998).

Xerxes Mazda, Yvonne Harris, and Ben Gammon, *Join the Great Fat Debate: The Production of a Discussion Exhibit at the Science Museum, London*, an unpublished internal Science Museum report (1998).

Yvonne Harris and Ben Gammon, *Join the Great Fat Debate Summative Evaluation*, an unpublished internal Science Museum report (1998).

Evaluation of Future Foods?, an unpublished internal Science Museum report produced by Creative Research Ltd. (1998).

Big Bang—Visitor Comments, an unpublished internal Science Museum report, ed. Nicola Perrin (1998).

Join the Great Fat Debate, an unpublished internal Science Museum report, ed. Xerxes Mazda (1998).

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From Comment to Commitment at the Monterey Bay Aquarium

Jenny Sayre Ramberg

I saw what one of your employees said about how long it takes to replace a fish you eat. I think that we should all think about that and act upon it. I know I will.

I really appreciate the aquarium, but I don't appreciate the political agenda you show in this wing!

—Visitor comments, *Fishing for Solutions*

The Monterey Bay Aquarium, which opened in 1984 on the site of a sardine cannery overlooking California's Monterey Bay National Marine Sanctuary, is dedicated to inspiring conservation of the ocean. Our use of talk-backs within a series of exhibitions has taken shape within that context, evolving over more than a decade from open-ended comment cards to public pledges to take action. Along the way, we've encountered unexpected lessons and developed new strategies.

We first used talk-backs in *Mating Games* (1993–95), an exhibition about reproduction and survival in the aquatic world. We were inspired by the way that the California Academy of Sciences used a talk-back in their *California Deserts* exhibition, diffusing controversy surrounding the use of a motorcycle as a symbol of human conflict with nature. At the end of *Mating Games* we invited visitors to share their opinions about the exhibition and the topic of reproduction. We also posted a changing selection representing the range of responses we received.

Then from 1995 to 1998 we conducted our first series of visitor studies that explored visitors' ocean conservation awareness, knowledge, attitudes, and behavior with Jeff Hayward of People, Places & Design Research. We found out that visitors were gaining awareness and knowledge, but it wasn't clear that they were changing attitudes or behavior based on their exhibit experiences. Visitors told us they were interested in learning what problems were facing the ocean, and they wanted to know what they could do in concrete terms about the problems that we described.

For the Future

The 1996 exhibition *Ocean Travelers* included a cluster of interpretive panels titled "For the Future" that showed examples of personal actions (like recycling or being a member of a conservation group) and asked:

What will you plan to do this year for the ocean's future?

What are you most concerned about?

How would you like to be involved this year?

Another sign invited visitors to "write your comments in the book and see what other visitors have said." Below was a binder with double-sided pages, each divided into four comment cards with this message at the top: "Tell us what you're planning to do this year for the ocean." Each week, visitors filled out about 50 of these pages. Our writer sorted through the pages to pick out a representative selection of comments to post.

This very open-ended talk-back inspired a wide range of responses. Comments reflected our visitors' generally positive feelings about the ocean and about the importance of protecting the ocean for the future. Their willingness to share their emotions, hopes, and commitments with us and other visitors demonstrated their desire to affirm their identity as people who care about the ocean. There was a consistent stream of comments from teachers and parents who reported on how they were already bringing the ocean and an environmental ethic into their work with children. Children's passionate promises to recycle, clean the beach, and become marine biologists filled us with hope.

The book's unanticipated popularity with children resulted in one minor challenge and, for the developer, a humbling experience. All the serious intentions about encouraging behavior change by getting visitors to write down promises were lost on children who saw an opportunity to draw or write things like "I love dolphins" or "I'll pee at the beach." Though such responses were not anticipated, exhibits staff did not think this was a problem. We were comfortable changing pages a few times a week, and clearly families and kids were enjoying the opportunity.

A bigger challenge came when some of our volunteer guides noticed that visitors were leaving offensive messages and swear words. Some guides, feeling it was unacceptable that any offensive content, even written by visitors, would be on the exhibit floor at any time, started tearing out pages and demanded that we take the exhibit down immediately. We decided to track and review all the comments over three months to see how often offensive comments were left. We found that the large majority of visitors used the talk-back in the ways we intended and that offensive comments, which we defined as racial slurs and obscenities, made up .7 percent of all comments. Given that exhibits staff changed out the paper every few days, we felt that this was an acceptable rate in order to maintain visitor access to all the recent visitor comments, not just the ones we'd selected and posted. Even though this talk-back remained, there hasn't been an open-access talk-back book since.

Fishing for Solutions

When we began work on the temporary exhibition *Fishing for Solutions: What's the Catch* (1997–99), we went a step farther and married the freewheeling talk-back concept with the goal of directing visitors toward a behavior change through a pledge-making activity. The "public written commitment," a strategy we adopted from community-based social marketing, aims to reinforce visitors' good intentions and increase the likelihood they will follow through in the future.[1]

Fishing for Solutions examined large-scale, international problems of overfishing, bycatch, and coastal habitat destruction. It featured shrimp, which are targeted by fishing, and other animals like sea turtles, which are affected indirectly. In nearby labels, videos, and dioramas, the exhibition also drew connections between overfishing, rising consumption of seafood, and population growth.

We were keenly aware that there were many reactions a person might have to learning that our love of seafood is exhausting the ocean's fish populations. We wanted to encourage visitors to respond by thinking of choices that fit their lives and to honor their different choices.

We were working on a sustainable seafood program, but our Seafood Watch program wasn't yet in place. So near the end of the exhibition, we included two activities—one that encouraged visitors to join conservation groups working to protect marine life and fisheries for the future, and one that focused on personal and consumer choices people could make in their lives to respond to this complicated issue.

Talk-back area in *Fishing for Solutions: What's the Catch.*

In the talk-back area, we tried something else new—not only inviting visitors to comment, but also showcasing comments, like the following, that staff had written in response to these issues:

> I made a pledge a few years ago that I would never eat anything older than I was. That way I avoid eating longer-lived, slow-growing fish such as sharks, sturgeon, rockfish and many others. It's just a way to stay aware that every time I eat a fish, it may take years before another grows to replace it; we need to harvest at sustainable rates. —Jim Covel, Coordinator of Guide Training

> My wife and I stopped having children after our second daughter was born. That way we "replaced" the two of us, but did not contribute to overpopulation. Maybe our choice and others' will let all children enjoy a more bountiful sea?
> —Jeff Bryant, Education Director

> I'll take the time to educate children, friends, and family about threatened fisheries. I'll also try to relate the problems and solutions to our daily activities, in order to bring the message closer to home. I believe by learning what we can do at home, we can make an impact on helping fisheries.
> —Audrey Li, Graphic Designer

A sign invited visitors to leave their thoughts:

People like you fish for solutions, too
The fisheries issues you've learned about are complex and changing. We believe the best way to keep up with the issues is to join a conservation group. People also make different personalchoices they believe will help ensure healthy fish populations, from how they vote, to what they eat, to how many children they have. Read what some of our employees and visitors are doing to help fish populations. What will you do to help turn the tide?

The large majority of comments were supportive and earnest. Some people thanked us for new information and expressed a commitment to take action. Some expressed heartfelt, even self-congratulatory, testimonials about their current good behavior: They reported that they already were vegetarian, taught their family about these issues, didn't eat seafood or shrimp, or were members of conservation groups. For those visitors, the activity was an opportunity to reinforce their worldview and choices.

In addition to hearing from visitors about their choices, we heard a lot about how they felt about the content of the exhibition—especially support of and anger about our population growth interpretation—as well as religious and political messages. There

was a steady thread of visitor comments on the topic of the role of God vis-à-vis human population growth and environmental problems. We posted a range of comments so visitors could read and respond to each other.

Some visitors didn't hold back:

> God created the heavens and the earth. How arrogant of man to think that he can "overpopulate" this place. What God created. He can sustain. My husband and I are hoping for a houseful of children (definitely more than 2). "GOD IS IN CONTROL"

> This "Let God save us" idea is what got us into this mess. The natural balance of Mother Nature is a delicate tightrope that has developed through countless eons. To believe that humans somehow have the "right" to knowingly upset this balance for fun and profit is a collective death wish.

Not all objections to the information that population was growing exponentially were religious:

> I came to see animals—not to get a lecture on the myth of overpopulation. Studies show that the earth can support up to 1000 billion people (*Time, US News and World Report*)

> The earth has plenty and to spare.

> I like the otters.

> If you can care for 4 children, then you should have 4 children! Stop the propaganda and stay out of our families!

We saved a selection of the cards we posted as a reference for future talk-backs. But we looked at the visitor experience as an end in itself—an exercise in reflection about their choices, a place for visitors to publicly declare their good intentions, voice their opinions, object to other points of view, and even proselytize.

We were both touched and amused by how much visitors relished the opportunity to tell us all the "good" things they were doing—like being vegetarian and teaching. We were reminded that raising the topics of population growth, family planning, and consumption will always trigger deeply held attitudes and passionate responses. We were inspired to do more exhibitions about things people really care about—and to ask them more often what they're thinking. Most of all, we were moved by how deeply visitors cared about the problems facing fishing and how meaningful visitors found it to participate in a kind of discussion with us and each other.

We were moved by how deeply visitors cared—and how meaningful they found it to participate in a discussion.

Talk-backs, we were learning

- offer an opportunity for visitors to vent anger, frustration, or depression;
- facilitate a sort of conversation among visitors with differing viewpoints and experiences;
- demonstrate that ocean conservation issues are complex, there are many actions an individual can take, and not everyone agrees about the best courses of action; and
- reinforce visitors' good intentions by asking them to make public written commitments.

Dear Governor Schwarzenegger

In 2006, we extended our talk-back concept still further. In the context of a small exhibition about a statewide environmental campaign to establish a network of marine reserves off the coast of central California, we replaced the open-ended talk-back with a "talk to the governor" postcard, and shifted the focus from "Tell us what *you're* going to do" to "Tell the governor what you'd like *him* to do." Visitors could write messages on postcards we provided, already addressed to Governor Schwarzenegger, and also read other visitors' cards, from a selection we posted to represent the range of responses.

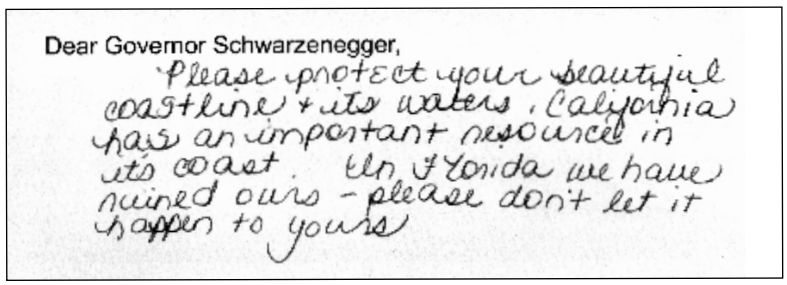
Label copy included:

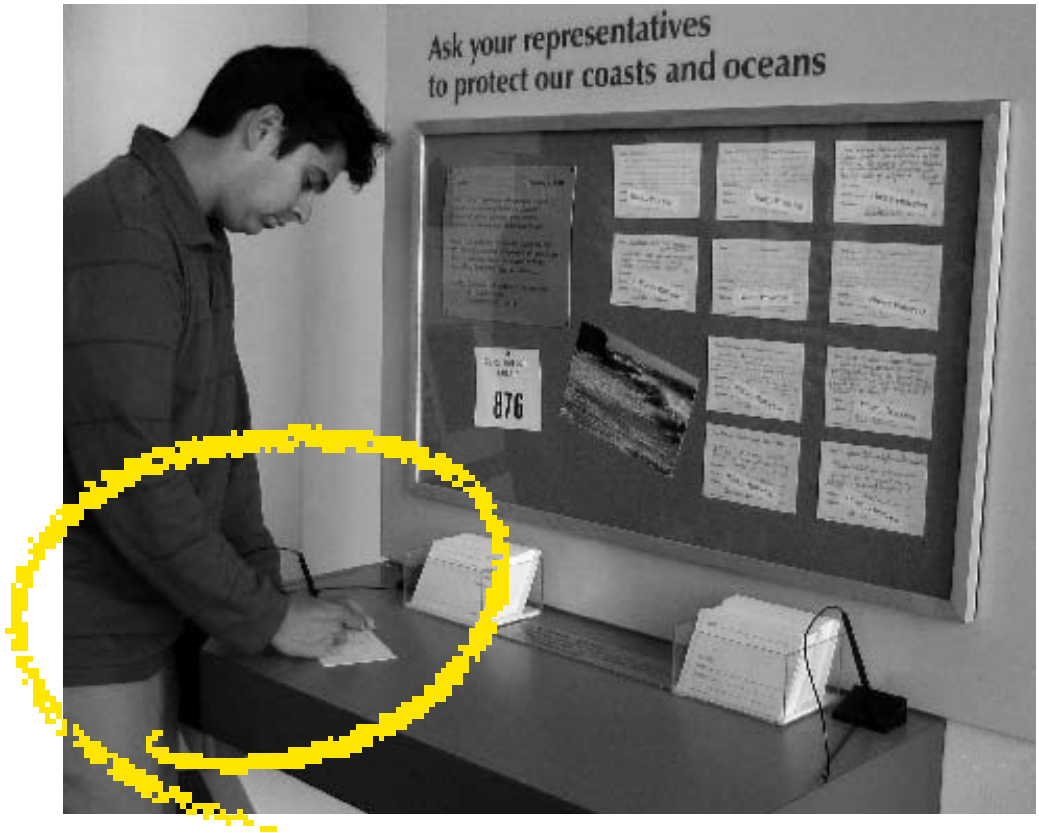
Ask the governor to protect California's ocean

This is a critical year for California's coastal waters. Between now and November 2006, the state will consider different options for marine protected areas along the Central Coast. Let the governor know that you want him to create the best possible marine protected areas for California's beaches and bays, fish and wildlife.

Write the governor right now

Let the governor know that you want marine protected areas that provide the strongest protection for California's beaches and bays, fish and wildlife.


Dear Governor Schwarzenegger,
Please protect your beautiful coastline + its waters. California has an important resource in its coast. Un Florida we have ruined ours - please don't let it happen to yours



Visitors continue to write thousands of postcards to government officials as this exhibition is updated to address current issues.

Because the topic was targeted to a specific issue and directed at an external person, we rarely heard directly from our visitors about their views of the exhibition or other visitors' comments. Almost 17,000 on-topic cards were written over the nine-month run of the exhibit. Again, children wrote a steady 10 percent of the cards. A faithful and hardworking volunteer read and sorted through 500 to 1,000 cards weekly. She discarded those that had no name or address, used profanity, or were unrelated to the ocean or environment—about 6,500 cards over the run of the exhibit.

In addition to sending many thousands of cards to the governor, a few thousand visitors also joined the aquarium's advocacy group, the Ocean Action Team, signing up on a touchscreen within the exhibit. Through the Ocean Action Team, aquarium visitors can continue to speak up for ocean conservation by writing e-mails, letters, and cards to urge the governor or other officials to act on issues from sea otter protection to the creation of marine protected areas to sustainable fishing practices. The Ocean Action Team and our web site are a kind of talk-back beyond the aquarium's walls and into the community.[2]

Perhaps this kind of talk-back could be called a "speak out." While the *Mating Games* talk-back gave visitors a place to tell the aquarium what they thought about an exhibit,

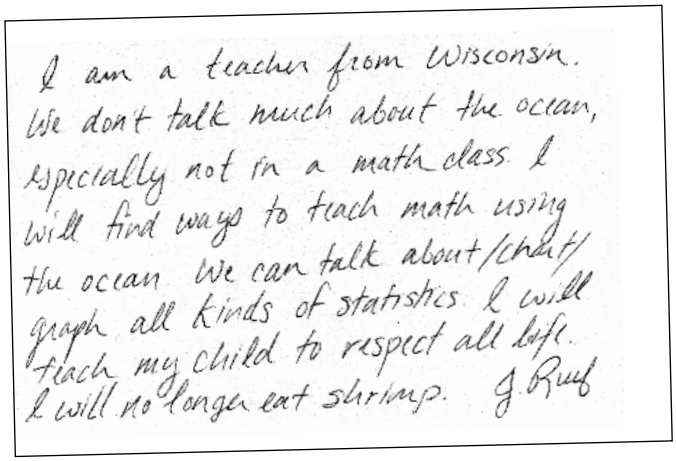
which led to a colorful visitor-led debate, this talk-back or "speak out" is about focusing the communication and the message to an outside decision maker. In their cards to the governor, people wrote messages like these:

"Don't let the seas die."

California is my home, and the ocean is dear to my heart. Don't let the seas die. Even now, there are beaches I walked along as a boy, where I saw sea shells all along the sand. The shells are gone. Don't let anything else vanish, too. Defend our Ocean!

Please protect your beautiful coastline + its waters. California has an important resource in its coast. In Florida we have ruined ours—please don't let it happen to yours.

Visitors can still see what other visitors write, but they rarely respond to each other. We have lost some of the conversation between visitors but may be harnessing the power of speaking up for what you care about, the possibility of engaging a representative, making a difference together. I think that there is room for all kinds of talk-backs in our exhibits; there is room to talk to each other, as well as to our movie star governor and senators.


I am a teacher from Wisconsin. We don't talk much about the ocean, especially not in a math class. I will find ways to teach math using the ocean. We can talk about/chart/graph all kinds of statistics. I will teach my child to respect all life. I will no longer eat shrimp. J. Ruf

JENNY SAYRE RAMBERG has been an exhibit developer at the Monterey Bay Aquarium since 1992. She and exhibit developer Eileen Campbell worked on the exhibitions described in this article, along with exhibit designers Jeff Hoke, Bob Bacigal, Lisa McKernin, and Andrea McCann and writers Melissa Hutchinson and Elizabeth Labor.

NOTES

1. The "public written commitment" is described in Doug McKenzie-Mohr and William Smith, *Fostering Sustainable Behavior* (Gabriola Island, B.C.: New Society Publishers, 1999).

2. If you are considering having your visitors write elected officials, you should have your lawyer review whether it would be considered lobbying.

Talking Together: Supporting Citizen Debates

Andrea Bandelli

Museums encourage dialogue among the public, and the scene of a group of visitors sharing their reactions at an exhibit is not unusual. Families and friends often comment to one another about their experiences, ask for assistance, recall memories, and illustrate connections and associations with things they've seen or done before. Sometimes even strangers will start a conversation.

Most of the time, when people talk together in museums, they are responding in some way to the exhibits. Some of these conversations are simply functional. The Exploratorium's popular Everyone Is You and Me exhibit, for example, requires two people to adjust the light levels and coordinate their positions on either side of a half-mirrored surface in order to see their images merge. Conversations usually start because the exhibit won't work without verbal collaboration.

In other cases, an exhibit may act as a catalyst for conversation. At Amsterdam's NEMO, up to four people can sit on stools at the Solar Airplane exhibit and bounce beams of light off mirrors to set in motion model airplanes suspended above. Once the light has struck the small solar panels on at least two of the airplanes and set their propellers in motion, control of a moving airplane can be passed from one player to another by redirection of individual mirrors. Players, especially young girls, stay at the exhibit for a long time, chatting about all sorts of things as they leisurely steer the planes around. This behavior is reminiscent of activities that are becoming rare today, like knitting or embroidering together, where long conversations arise while the "main activity" provides the background and the reason to be together.

And then there are exhibits where visitors' words are the content, the exhibit's very *raison d'être*. Some of the components of the Exploratorium's *Memory* exhibition were of this kind—in particular Remembering Nagasaki (see pages XX–XX). But, although the words were shared with other people, this experience was more solitary than social.

Stimulating and structuring conversation

An example of a museum activity in which verbal social interaction is central is DeCiDe ("Deliberative Citizens' Debates"), a project developed in 2004 by a consortium of European science centers that has the specific object of stimulating and structuring conversations about controversial science issues like stem cells, nanotechnology, and genetic testing.

DeCiDe debates employ a simple board game format designed for a group of five to eight people. There is no physical exhibit or expert to provide information—only 48

cards that cover the basic facts about each topic and provide entry points for discussion. Nevertheless, each discussion is extremely rich because the participants contribute their own knowledge, which most of the time is not structured in academic or formal ways, but is pertinent to the subject. Each discussion takes about 90 minutes, during which the participants first clarify their personal views about the subject, then find common ground on which they all share a position, and finally create their own policy or vote on the policies provided as examples.

Several hundred DeCiDe events have been carried out in Europe, the United States, Canada, and South Africa, and participants regularly enjoy the conversations. Evaluation shows that participants not only feel that the DeCiDe format gives them permission to talk about subjects that otherwise wouldn't easily come up, but they also come to appreciate that all participants know more than they had expected.[1] The following are typical comments:

> What I liked the most is the fact that we were able to discuss, because it's fun to confront yourself with other people and exchange opinions and sometimes even expertise, because everyone brought her/his own knowledge.
>
> —Martha, 24, researcher, Newcastle, U.K.

> In my opinion this has been the most interesting part, to listen to everybody's opinion. —Marina, 24, Geologist, Trento, Italy

> I am happy and I feel satisfied, because at the beginning I had an idea and then by discussing it I changed it. —Carlo, 25, student, Trento, Italy

A DeCiDe debate at Munich's Deutsches Museum. The game-like format makes it easy even for strangers to talk about subjects that otherwise wouldn't easily come up.

Evaluation also has used "concept maps" to show that taking part in a group discussion leads participants to question and challenge their preconceptions and build on their existing knowledge. Participants map their associations with a particular topic or issue before and after a discussion. Before the discussion, associations are mostly technical items and bits of information. After the discussion, these concept maps include many more questions and, often, ethical, moral, and social issues.

Another regular outcome of DeCiDe group discussions is the collective acknowledgment that in order to make good decisions it is necessary to have access to many different information sources, and time to reflect on all of them.

Board game format for DeCiDe debate.

A project like DeCiDe reaches audiences that go beyond the typical science center public. Museums and other professional organizations are using it with staff, and the European Commission refers to DeCiDe as a model tool for the training of policy makers. The project enjoys "viral marketing" by its participants, with the number of kits downloaded from the web site doubling every two months. Although science centers now play only a marginal role in terms of events organized, they were the catalyst that set the project in motion. The experience of taking part in a DeCiDe event—with the realization that everybody has a voice worth listening to—is for many people an empowering one.

Challenges: numbers and time

Contrary to the common exhibition format, where the average time spent on an exhibit is a few minutes and turnover of visitors is very high, dialogue activities like DeCiDe engage limited numbers of participants for a relatively long time. Given the current economic model for science museums, which is based on visitor numbers, it can be a challenge to justify experiences that necessarily focus on small audiences.

Some museums have used polls, voting mechanisms, or comment cards to enable larger numbers of visitors to express their opinions on various issues. But the actual dialogue in these cases is limited, since it takes the form of "responses" rather than articulated conversations. In DeCiDe, we have captured the final formulation of the policies and the ways participants vote through reports posted on the web site. But we have very limited tools for recording and summarizing the discussions in a way that is

A dialogue is possible not just when people begin to speak, but when they start to listen.

meaningful and useful to other people and that captures the richness of the exchanges.

We know from the evaluation that most participants have clearest memories of the process of discussing, evaluating options, and considering different positions, while very few remember the outcome of the activity in terms of the policy that was discussed. It would be possible to make a video recording of the discussion, but, for those who don't take part, watching it would be a rather boring experience and in any case would not necessarily capture the outcomes. What is missing is a way to derive value from the discussions, drawing on the contributions of all participants, and to make this available to other users.

A question of trust

Museums are often seen as reliable sources of content and information, and this role is regarded as one of their major assets. If museums are to develop mechanisms like DeCiDe that build on participants' experiences, pool information and perspectives, and create knowledge that can be exploited by larger groups, they will need to find more ways to share authority with the public. They will also need to create the conditions that enable people to trust each other.

If museums can trust the public to the extent that they relinquish some control of their content and put it into the hands of the public, they will change from being *sources of information* to serving as *platforms to support conversations and exchanges.* An "exhibition" in such a museum will not only display content, but also offer a collection of tools to capture and share content from its visitors.

One further lesson from the DeCiDe experience: A dialogue is possible not just when people begin to speak, but when they start to listen. Despite many museum efforts to encourage people to comment, speak up, and have their say, it is unclear whether anyone is actually listening. In many institutions, only the floor staff and the marketing department are actually interested in what visitors have to say.

Do we have institutional mechanisms to sustain a dialogue with our visitors? Most importantly, are we really listening to what our public wants to share with us?

ANDREA BANDELLI is an independent museum advisor based in Amsterdam and director of project DeCiDe (www.playdecide.org).

NOTE

1. Sally Duensing and Andrea Lorenzet, *DECIDE Evaluation Report* (March 2007).

Asynchronous Conversation: Experiences with a Video-Response Kiosk

Barbara Costa

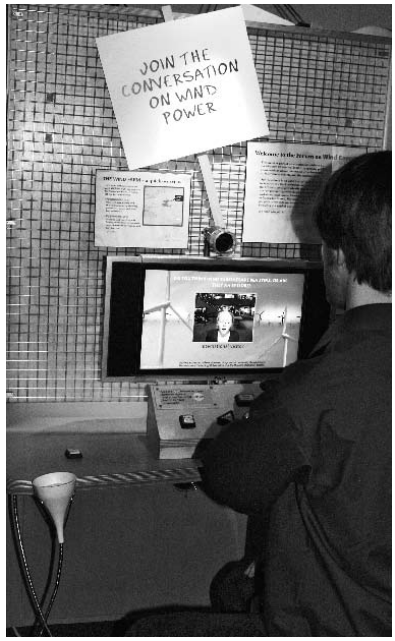
At the Museum of Science, Boston, we've been experimenting since 2005 with the use of a video-response kiosk to explore how visitors' views can be integrated into exhibits. This effort is part of the museum's Forum initiative, an experimental project in engaging the public in conversations about the societal implications of science and technology.

Forums are mostly, but not always, live events in which people meet face to face in small discussion groups. Museum staff or outside experts provide information about a topic, and the Forum team uses various methods to elicit the sharing of values, priorities, and perspectives. Our goal in these gatherings is to motivate and enable our visitors to develop as full a picture of an issue as possible and to reconsider their own mental models.

By considering the range of experiences and viewpoints that each participant brings to the table, we hope people will enlarge their approach to decision making about science and technology topics. We want the museum setting to be perceived as a place to be involved in this dynamic questioning while still maintaining public perception of the museum's neutrality.

We see the video-response kiosk as a physical manifestation of a Forum experience, a way to enlarge participation beyond the 30 to 50 (or so) people who might come to a single Forum event. We want to see whether an "asynchronous conversation" could take place in which people will listen to others' views and have the option to respond with their own opinions.

The kiosk was adapted from an existing software model developed by Paula Sincero of InquiryLearn in collaboration with Brad Larson Media. They worked with us to create a flexible program that enables us to change questions and other features. Deb Sovinee of the Museum of Science designed the physical housing for maximal flexibility in posting information—on one side, encouraging visitors to join the conversation ("Listen, Think, Respond"), and on the other, providing some indication of the range of issues. Objects and articles can easily be replaced and updated in response to current events and interests.



Forum kiosk at the Museum of Science, Boston

Expert voices appear at the left—the place most visitors look first.

A conversation about wind energy

For our first Forum kiosk topic we chose wind energy—an issue of local significance because of a proposal to locate a wind farm off the coast of Cape Cod. The issue was familiar to the public, and it had other important ingredients for conversation: some controversy and clear stakeholders. A nearby exhibit provides background about wind energy, including a component that compares tradeoffs of a variety of energy sources.

In this case, the main goal for the kiosk is to promote visitor learning about wind energy and its societal and environmental implications by allowing visitors to listen to diverse perspectives on the subject and contribute their own opinions. Other goals included exposing visitors to the complexity of the wind energy issue, having visitors feel that their opinions are valuable, demonstrating that diverse perspectives are respected, and helping visitors to understand that all technology has both intended and unintended outcomes and consequences. We targeted adults and children over the age of 10.

On the attract screen, the words "Opinions, Tradeoffs, Choices" fly off the turbine blades. Visitors can then select one of five questions (e.g., What effects of wind power on the environment and wildlife do you think about most? Would you support the development of a wind farm in your area? Do you think wind turbines are beautiful, or are they an eyesore?)

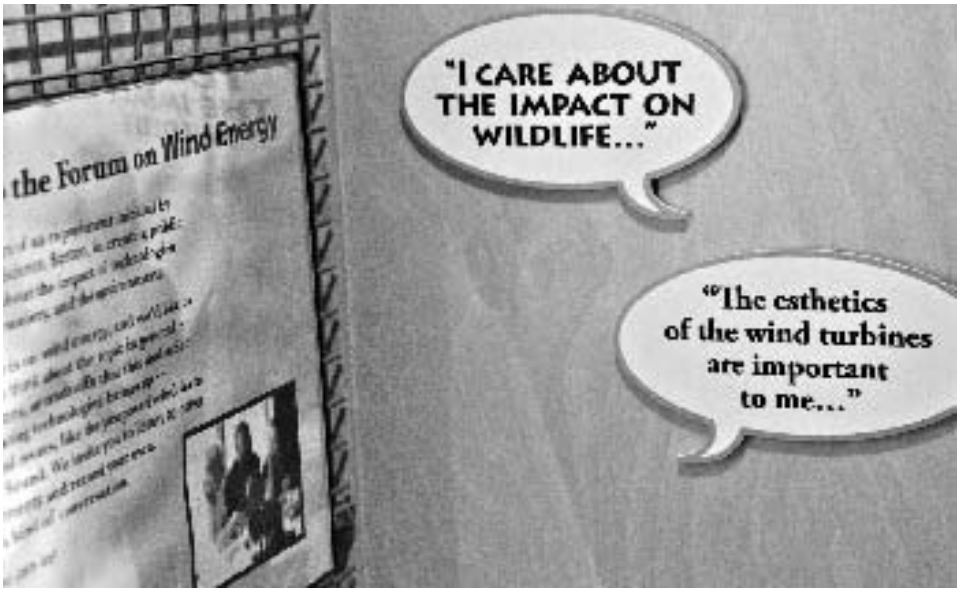
Within each question, the screen shows a horizontal row of four videos that can be viewed. Three of these are prerecorded statements by stakeholders, including

proponents and opponents of the proposed off-shore wind farm—and others with varying views in between. These videos are placed first so that visitors hear a range of views right away. Testing showed that many people select only one video to view, usually the leftmost; so to ensure that the museum is perceived as neutral on the topic, we reordered our stakeholder videos to make sure that that a variety of viewpoints are represented by the leftmost videos on each of the five question screens. In the fourth, or rightmost, position, there is a video recorded by a museum visitor. Scrolling to the right reveals up to 60 or more visitor recordings per question.

Users can then add their own opinions by advancing further to the right and selecting the "Add Your Opinion" button. Once a video is recorded, the visitor can choose to delete or save it. Newly recorded videos are displayed publicly only after a staff member has reviewed and approved them.

When recording a video, visitors are asked to choose a description for themselves. Options include geographic descriptions (e.g., Cape Cod resident, Massachusetts other than Cape Cod) and viewpoint on the question (e.g., Approve, Disapprove, Not Sure). We think that visitors might be more apt to scroll through the videos to see who else feels a certain way about the question. A duplicate kiosk is located at the Cape Cod Museum of Natural History, where visitors are more interested in the geographic descriptors, given that the local issue is of such importance to them.

The kiosk is adaptable to other topics, and a number of parameters can be changed (e.g., the personal descriptors and number of visitor videos stored and displayed). The kiosk can also display a cumulative poll, indicating how many people have described themselves as holding various positions on a given question.



The video-response kiosk is a physical manifestation of a Forum discussion.

Visitors have recorded hundreds of videos, some nonserious and off-topic, but many on-topic and thoughtful, including these:

How do you feel about the proposal to build a wind farm on Nantucket Sound?
There may be some aesthetic issues, but it's certainly prettier than a smokestack. With Buzzard's Bay and Nantucket Sound already awash with tankers and oil coming in, it will be much nicer to have renewable energy than the continued importation and burning of fossil fuels.
—30- to-40-year-old male

Are wind turbines beautiful or ugly?
As long as the turbines are appropriately designed and don't devastate the surrounding coastal habitat or the countryside, I don't think it really matters whether people think them good-looking or not, because we are approaching a stage where we will have no choice. We will soon become desperate for renewable energy, especially in the next 30–40 years. —15- to 18-year-old female

Lessons and reflections

One month after installation, remedial evaluation was carried out by Kristin Sargianis of the museum's research and evaluation department. Although the wind energy exhibit that would have provided context for the kiosk was not in place until later, the evaluation suggested that

- most visitors reported finding the kiosk interesting.
- most visitors felt that recording their own opinions was the most interesting aspect of the interactive.
- about one-quarter of visitors felt that listening to other people's opinions was the most interesting aspect.
- the unidirectional interface we used, which limited us to one row of videos and only four faces on screen at a time, did not give a visual sense of the large number of visitor recordings. Changing this might encourage greater sampling of visitor videos.[1]
- the attract-screen central window showing a live video feed was a veritable magnet to children and encouraged more nonserious interactions. (We removed it.)

Other changes that might increase chances for people to both listen and respond on video include posing fewer questions, shortening prerecorded stakeholder videos, and requiring visitors to view two videos before being able to record their own.[2]

An ideal situation to maximize the intended use of the kiosk would be to have people use it after a related program or discussion with an exhibit interpreter. Groups that are brought to the kiosk may also take advantage of a function that allows them to select the videos they've recorded and edit the selections to create a video they can take with them.

With these lessons learned, we continue to be interested in exploring ways to engage visitors in considering the implications of technology as an additional component of their museum experience.

BARBARA COSTA is project manager for Forum (www.mos.org/forum) at the Museum of Science, Boston.

NOTES

1. Because of its commitment to universal design, the Museum of Science does not use computer touch screens, but rather a navigation system that allows navigation in one axis only, using large Happ buttons.

2. The wind energy kiosk and its evaluation were supported by the Massachusetts Technology Collaborative and Renewable Energy Trust; additional funds were provided by the Small Business Administration.

Mapping Many Voices: A Platform for Dialogue

Pasi Karhu, Mia Marttiini, and Mikko Myllykoski

Museum and science center visitors are open to encountering unknown adventures and perspectives. Often they come in groups of families or friends or classmates, and they share experiences that link them together. But those who come alone might also be eager to develop relationships with other visitors, to describe their perceptions, and to get a chance to debate, communicate, and cooperate. Heureka, the Finnish Science Centre, is experimenting with ways to provide platforms for dialogue and help people make these connections. One promising platform, the Self-Organizing Map (SOM), is the focus of this article.

Would it be possible to offer visitors a platform to find other visitors with common ground and interests?

At Heureka, a survey carried out four times a year shows that visitors consist of equal numbers of males and females and 25 percent students; 1 to 2 percent come alone, and more than 80 percent are repeat visitors. The survey also includes 19 questions about visitor opinions. All of this data is a useful barometer of how things are going at the center.

But looking at the survey results, we started asking ourselves questions: Who are our visitors really? What kinds of groups do they form—or do they form any clear groups at all? Could the science center react to their feedback, have a dialogue with them, and address their individual needs more precisely in some way? Would the visitors like to know a bit more about themselves—for example, how their background and opinions compare to those of other visitors? Would it even be possible to offer them a platform to find other visitors with common ground and interests—or to exchange views also with those who really have a different point of departure?

Match-making machine

Imagine being a schoolgirl living in a remote area of Lapland. You do the typical teenager things with your friends and family. You also have an irresistible need to understand the changes taking place in the climate, but you feel isolated because there are few people around who share your interests. One day you go to a science center with your class. The climate exhibition thrills you. It sparks intriguing discussions on your way back home and over the dining table. But the following week you are more or less alone with your ideas again.

Then you get an e-mail from the science center. It has started to collect visitors' information and feedback with a new visual mapping method. You are astonished by the number of new acquaintances in this virtual guesthouse. With an opportunity to form your own tribes, you are no longer dependent on your cultural and physical background. Now the shared interests and affinities bind you together with new networks of people and open forums. This is mind-blowing for a girl who always felt herself a loner. From now on, it's all up to her.

Self-organizing maps

Unconsciously, we continuously analyze data and map out the small details. Which of our relatives, friends, or work colleagues would enjoy a hot air balloon adventure? We quickly start to come up with some names for the "definitely" list, some for the "maybe" list, and some for "definitely not." Is there a place in our brain that says, "This person does not like hot air balloons"? Of course not—it's many, many small details, both conscious and subconscious (and varied for different people) on which we base our assumptions. All the details make a probable mapping in our brain of the "adventurous types of people" who would enjoy a hot air balloon ride. And we might even know the odd one out who is actually afraid of high places but would still take the ride.

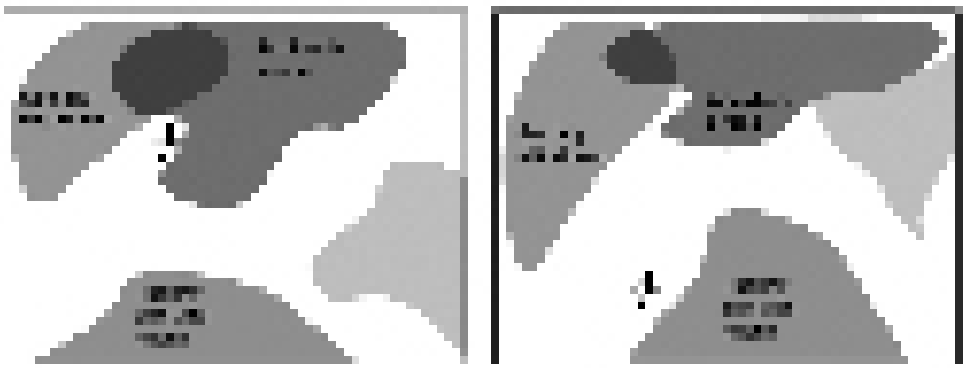
When we need to digest vast amounts of raw data—a real issue in this time of information overload—we need new tools, however. Graphs, histograms, pie charts, and other statistical tools can help. But where is the overall picture? If we delve deeply into the data and take enough time to thoroughly understand numbers and statistical charts, there is no problem at all. The human mind is superb at seeing patterns and creating the big picture from numerous small details, if given enough time. Time, however, is a luxury that we seldom have.

There is an invention that can help us far more easily see the patterns in large amounts of data. The Self-Organizing Map (SOM), developed by Teuvo Kohonen, a Finnish pioneer of neural network theory, automatically learns relationships among individuals, based directly on the complicated multidimensional raw data available, and groups them on a two-dimensional surface, or map. On the map similar items are placed near each other. Visual emphasis by shape and coloring according to data attributes then gives a natural overall understanding of the individuals and groups that they form. [1]

This technique was developed in the 1980s, but only recent increases in the power of computing and advanced visualization techniques have tamed this neural network computation into a feasible everyday tool. SOM technology helps us seeing the big picture without losing nuances. Each user is positioned in relation to others in a meaningful way.

One example of using the SOM tool was a Virtual Clinic executed by Studio Mind in 2005. This SOM analyzed medical records and data about clients' lifestyles to help a health clinic map clients' care needs. The resulting "Risk Zone" map, designed for internal use, enabled the clinic to keep track of trends and phenomena chronologically on the map, focusing on both individuals and groups

But as an anonymous Internet service, the map also opened up a personal online view of an individual client's private Risk Zone map, enabling the client to find his/her own location in relation to other people and to different risk groups. Being in a "healthy drinking habits" area is comparatively safe, for example, but getting into risk zone areas raises the alarm and presents an opportunity for guidance. For the individual, it is naturally important to keep track of one's own individual choices and trends: "If I choose that track, it will obviously lead me into . . . "

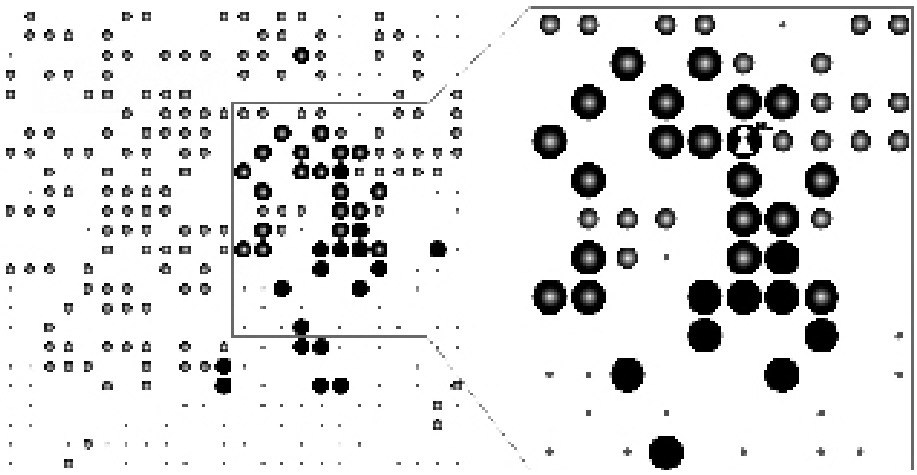


A health clinic used a variant of the Self-Organizing Map to help clients visualize their risk zones and track changes. On the left, three months ago; right, on the road to recovery.

SOMs and science museums

How can SOM technology be used in the context of a science museum? At Heureka, we are experimenting with an open discussion forum based on SOMs to form a virtual guesthouse where individual voices are heard and dialogue is possible.

Let us take as an example a group of school children visiting Heureka who present their individual opinions on a given issue. Everybody gets a position on the map. Even the lone wolf of the class is likely to find soulmates among the other visitors. The general understanding is that there are many individuals and many voices. The uniqueness of our viewpoints offers more sparks for a discussion. The SOM puts me and us on the map with others. With an easy opinion-mapping interface, you can find like-minded and differently thinking people and groups for better understanding.



The Self-Organising Map (SOM) represents visually the complex data collected from many individuals, automatically grouping individuals in a meaningful way. In this version, visiting school children appear as a coherent group (left). A closer view (right) allows an individual to see herself among others and ask questions. "Wow. I'm among the boys. I wonder why."

Mapping and matching our visitors

To move forward with the idea of listening to many voices, we began by using SOMs to analyze existing visitor feedback. Which hidden groups could we find in the already existing data? Are there groups that are totally missing? Who leaves happy and why? Who leaves unsatisfied and might never return? Where could we spot some room for improvement?

In the next phase we are inviting our visitors to join an active dialogue with us and among themselves. A web-based service will also be a physical exhibit at Heureka. The new service is more future-oriented, dealing with the issues that we are working on, developing programs and exhibitions. The service will give the users not only a voice, but also the possibility of searching the map of feedback from other users. In this open forum, a virtual guesthouse, the individual voice is not only heard but can also engage in dialogues.

The third step will be to actively revisit the strategies of the science center from this new perspective. Who knows, the future Heureka's core ideology may not simply be "to bring the joy of discovery *to* everyone," but "to *share* the joy of discovery *with* everyone."

PASI KARHU and **MIA MARTTIINI** are the founders of Studio Mind (www.studiomind.com), and **MIKKO MYLLYKOSKI** is experience director at Heureka, The Finnish Science Centre (www.heureka.fi), Helsinki, Finland.

NOTE

1. Teuvo Kohonen, *Self-Organizing Map, Third edition, Series in Information Science* 30 (Berlin, Heidelberg, New York: Springer, 2001).

Building Science Buzz

Bryan Kennedy and Liza Pryor

Sometime today, you'll probably hear or read a news story related to discoveries or claims made by scientists. What do these discoveries and claims mean to you? To our society? To the world? How many people take time to consider such questions? At Science Buzz, an on-site and online project of the Science Museum of Minnesota (SMM), we not only ask our visitors these questions but take the bold step of inviting them to answer.

Our project grew out of a small initiative that allowed the museum to test ways to bring in current science and make it relevant to visitors. With funding from the National Science Foundation, Science Buzz expanded to include an active online community web site (www.smm.org/buzz); a research and development project that contributes to exhibit components in every SMM gallery; and a testing ground for new exhibit ideas and practices. Evolving social technologies have allowed us to revolutionize our exhibit development process while giving museum visitors (both physical and virtual) a new way to discuss science issues.

Designed for change

The Science Buzz format blends up-to-the-minute science news (linked through digital feeds) with more traditional interactive experiences, graphics, and object-based displays. Everything works through the use of templates—a library of reusable furniture pieces, graphic formats, digital components and programs, and conventions for structuring content—that allow our team to feature any type of content, create experiences quickly, and respond to breaking science stories in real time. These digital templates use an array of techniques—RSS, tagging, XML, VXML, and an open source content-management system—to deliver content to displays, computer kiosks, and the web site.

An example of a template is the popular Science Buzz Quiz Show, where three visitors compete against each other as they try to answer questions about science news stories. Content can be changed easily through simple edits to a text-based XML file, so the exhibit is always current and relevant to visitors.

Another key template is the community-based Buzz Blog, where visitors can create content in the form of a web log posting or an answer to an online poll. Content is delivered to the floor in a modified form at the same time it is pumped out to the Web. On the floor, the experience seems like any multimedia component, but the content comes over the Internet. Not only visitors but also museum volunteers, floor staff, and youth interns have responded to questions and blog posts on-site—thus broadening staff participation in the web site.

Visitors, museum staff, and volunteers all contribute to Science Buzz, both online and on the exhibit floor.

Buzz Blog has produced some powerful interactions. A post about a local girl, Gabby, who can't feel pain because of a rare neurological disorder promoted a lengthy online discussion. Postings included unsolicited contributions from Gabby's father and friends, as well as from a mother who thinks her child may suffer from this disorder. (Gabby's dad offered his phone number and e-mail address for support.)

Other templates include Scientist on the Spot, where visitors can pose questions to selected researchers; Buzz Polls, which solicit votes on issues surrounding current news stories; and Object of the Month, where we connect objects from our collections to science in the news and invite visitors to write labels and stories for these objects.

Our user-friendly content management system (powered by Drupal) also lets exhibit developers get content out quickly to the Web and the museum floor using the Science Buzz platform. Because our templates permit us to work fast and even start over completely, we have the freedom to fail every once in a while and try things that other development groups might avoid.

Moderation of comments to all components amounts to 3 to 5 hours per week. Shared among team members, it never becomes the time drain that colleagues elsewhere say they fear in such a venture.

Volcanoes

Is Mount St. Helens OUR Vesuvius?

The eruption was the worst volcanic disaster in US history

Photo by Austin Post, USGS, on May 18, 1980

On May 18, 1980, Mount St. Helens erupted. Shaken by an earthquake (5.1 on the Richter scale), the north face of the mountain collapsed in a massive avalanche. Nearly 200 square miles of forest were blown down or buried beneath volcanic deposits. A mushroom shaped column of ash rose sixteen miles into the sky and drifted downwind, darkening the sky as it fell over eastern Washington and beyond. The eruption lasted 9 hours, but Mount St. Helens and the surrounding landscape were dramatically changed within moments.

The processes, effects, and products were the most intensively studied and photographically documented of any explosive volcanic eruption in the world to date—even shedding light on the eruption of Vesuvius that buried Pompeii.

Have you ever experienced a natural disaster? How did it make you feel?

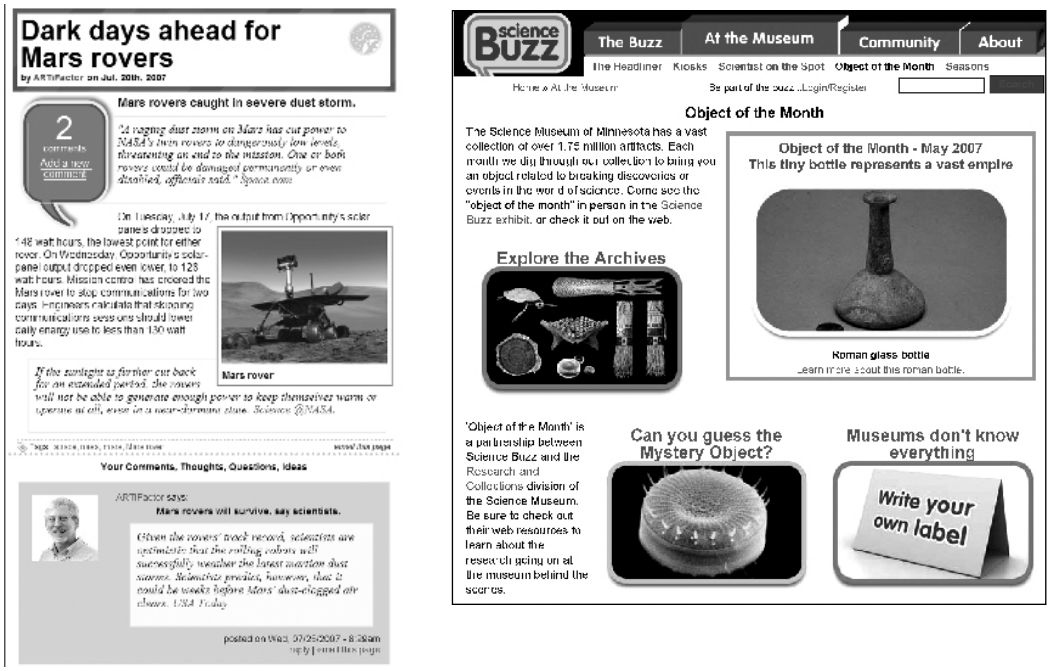
We want to hear what you're thinking and feeling.

Scientist on the Spot

Ed Fleming, Curator of Archaeology

Volcano Stories from the Buzz Blog

- The earth bursts forth at Mount Saint Helens
- Volcano convention underway
- Indonesian earthquake
- Digging Deep
- Augustine erupts!
- Lost civilization found in S.E. Asia
- Titan's Volcanoes Spew Ice
- Mount St. Helens erupts again



Science Buzz uses templates and a content management system to make updates easy.

A global audience

Publishing for on-site and online visitors at the same time turns out to be far from mutually exclusive; in fact, it often proves beneficial for both groups. Within hours of the devastating October 2005 earthquakes in Pakistan, for example, we were able to post information on the science behind the disaster. To our surprise, web visitors from Pakistan were some of the first to post comments on the Buzz Blog. People on the ground got a scientific perspective on their tragedy, while museum visitors got a personal perspective—all in real time.

In formative evaluation during our first years of operation, 75 percent of visitors exiting a Science Buzz area said they had encountered an exhibit that emphasized how "science is happening now." Perhaps most important, Science Buzz has created the institutional expectation that at least some of our exhibits and web presence will support community interaction and provide a structure for dynamic and changing information.

BRYAN KENNEDY is an exhibit developer and **LIZA PRYOR** is a senior exhibit developer at the Science Museum of Minnesota, St. Paul.

Adapted from an article that originally appeared in the July/August 2006 issue of *ASTC Dimensions*.

Learning from Visitors to *Slavery in New York*

Richard Rabinowitz

Like many museum people, I used to greet exhibition openings with relief. For better or worse, our show was up. Years of fund-raising, research, writing, design, fabrication, and installation were blessedly over. Now it was the visitors' turn. We organizers turned gladly to the next challenge, leaving educators and visitor service staff to welcome the crowds.

Opening night in the theater is very different. The champagne may taste the same, but everyone knows that this moment marks the beginning, not the end (unless the reviews are terrible). Now the "real" show begins, with performances night after night.

As museums become less custodial and more performative, this distinction is collapsing. The interpretive designer of a history exhibition no longer expects visitors simply to imbibe exhibit content. The exhibition is now designed to provoke visitors into thinking and constructing historical narratives for themselves. Of course, all good teaching aims for that as well. Unlike a classroom, though, a museum exhibition seldom offers much opportunity for visitors to register their reactions.

Capturing stories

Registering reactions was an important part of the visitors' experience of *Slavery in New York*, a 9,000-square foot exhibition that opened at the New-York Historical Society in October 2005. In addition to hundreds of original objects and documents and dozens of videos and interactive devices, American History Workshop included near the end of the exhibition pathway a Telling Lives story-capture station, where visitors were invited to stop and record their thoughts.

Just over 175,000 people saw the exhibition during its five-month run, the most in the society's 201-year-long experience. Of those, 6,000 visitors, about 80 percent of them African Americans, devoted 10 minutes to recording their reactions. These recordings provide an extraordinary archive for studying how museum visitors make personal sense of a public interpretive installation.

The Telling Lives system asked visitors a series of questions: "How did you hear of the exhibit? What was your overall impression? How did the exhibit add to or alter your previous knowledge of the subject? What part of the exhibition was particularly noteworthy?" From previous research, we knew that relatively imprecise questions like these were best at eliciting progressively more complex responses. With the help of Chris Lawrence (pp. XX–XX), I have been reviewing the 1,000 hours of video files. This is a preliminary report on what we have heard from our visitors.

The Telling Lives story-capture booth invited visitors to record their responses to *Slavery in New York*.

Sorrow, anger, understanding

Most commonly, visitors registered surprise at the scale, duration, and significance of slavery in New York's history, although Caribbean and African visitors frequently described having better education about the history of slavery than people raised in the United States. Often white New Yorkers expressed a kind of possessive sadness that the economy of "my city" was rooted so deeply in the slave trade and plantation agriculture. Not a single black respondent shared this particular disappointment. Many more felt the exhibition confirmed what they already knew of the importance of slavery to America and to New York. Where many visitors blamed their schooling for obscuring this history from them, blacks were less shocked by this "failure."

The media elements in the show rated particular notice. Visitors praised a video re-creation of four 18th-century African women at a city well for vividly presenting the resourcefulness of enslaved people. Visitors also responded powerfully to stories of individual black actors in New York's history. But, remarkably, virtually every single document, object, media piece, or design treatment fit someone's definition of "most noteworthy."

It was in response to the third or fourth question that visitors, now warmed up, typically began relating the exhibition to their previous knowledge and experience. About 10 percent, most of them black men, were angry—angry at slavery and racism, and angry at the exhibition for inadequately denouncing historical atrocities. An equal number of black respondents were simply gratified that their ancestors, long neglected

in historical accounts, were now receiving attention from a mainstream institution like the New-York Historical Society. But most African-American visitors focused positively on their learning new pieces of black history—the use of slaves to build New Amsterdam's infrastructure, the opportunities for freedom afforded blacks during the Revolutionary War, the intensification of racism in the wake of emancipation.

Most important, the respondents linked the exhibition to their personal histories. A young black lawyer noted her "shock at how New York's municipal code was used" to intensify the repression of enslaved people in 18th-century New York. A young woman promised that she would feel very differently about "returning to work on Wall Street next week, knowing that it was first built by people who looked like me." Sometimes, in retelling their lives to accommodate facts and concepts newly acquired, they provided interesting data for the city's and nation's black history. An older man reported that the "Well" video helped him finally to understand why "white people will just barge into a quiet conversation among blacks, so impolitely, and ask, 'What's going on here?' They're so fearful of what black folks might be thinking or talking about, or what they might do if they were not working."

Finally, for some visitors the exhibition was most appreciated for its contemplative, aesthetic, or "spiritual" value. Art pieces like the wire sculptures depicting the bodies of 17th-century black New Amsterdamers, the Akan-language recollection of the 1712 slave revolt, or the hymns and parade music written by 19th-century black men generated heartfelt, sometimes tearful, responses.

As a 40-year veteran of history museum interpretation, I can say that I never learned so much from and about visitors.

As a 40-year veteran of history museum interpretation, I can say that I never learned so much from and about visitors. The installation confirmed psychologist Jerome Bruner's suggestion that students can usefully "externalize" their understandings before quitting the learning experience.[1] Knowing more about the impressive men and women who use our work to fashion their own understandings of the past can alter everything we do in planning exhibitions.

RICHARD RABINOWITZ, president of American History Workshop, was curator and writer of *Slavery in New York.*

Adapted from an article that originally appeared in *Cross Ties: News and Insights for Humanities Professionals* 1, no. 3 (Fall 2006). Reprinted with permission of the Mid-Atlantic Regional Center for the Humanities.

NOTE

1. Jerome Bruner, *The Culture of Education* (Cambridge: Harvard University Press, 1996), 22.

Talk-Back Culture

Chris Lawrence

In 2005, when the New-York Historical Society's exhibition *Slavery in New York* opened, I was a graduate student at Bank Street College of Education, working toward my master's degree in museum education. Richard Rabinowitz of American History Workshop (AHW), curator of the exhibition, asked Nina Jensen, director of the museum education program, if she had a student who might want to work with audience response videos collected in the exhibition, and she suggested me. After meeting with AHW and learning about the project, I quickly decided this was an exciting topic for my independent study and the way I wanted to finish my graduate work. That was the beginning of hours of listening, watching, and learning.

In a departure from the traditional narrative of early New York history, *Slavery in New York* didn't present the Dutch as virtuous businessmen, 'ole Pegleg' Peter Stuyvesant as a cartoonish patron saint, or New York as a free land for African slaves. Instead, the exhibition detailed the city's involvement in the slave trade, and the reality that many New York institutions, such as Wall Street, were built on the backs of black slaves. The venerable 201-year-old historical society was saying: It happened here, too. As I prepared to view the videos, I wondered: Would the exhibition reopen racial wounds? Would European Americans be offended? Would African Americans be angered at having to relearn this history? Would the public notice at all?

As it turned out, they were noticing. The conventional measures of success were all there—record attendance, including 45,000 school kids who came for educational programs; prominent coverage in the *New York Times*; a decision to extend the exhibition's run; and even a plan to develop a second installment of the exhibition, which opened in 2006 as *New York Divided: Slavery and the Civil War.*

But AHW wanted to know more than numbers served and demographic breakdowns: What were people thinking and feeling? And what prior knowledge had been challenged? Luckily, we know what thousands of visitors thought because they told us via the exhibition's video booth.

Listening

AHW had earlier experimented at the New-York Historical Society with capturing visitors' thoughts about going to school in New York City, using a video recording booth and special software they called Telling Lives. When they decided to use this system in *Slavery in New York*, Telling Lives had a bigger mission—to find out how people would react to this "truth hurts" subject matter, and what raw emotions, thoughts, and impressions could be captured when people exited this scab-peeling exhibition.

The original plans were that I would create a spreadsheet with notes about all of the recordings and then help choose a selection to include in the exhibition. The goal was to get responses into the exhibition quickly, as an interpretive element. However, once I got the first 200-gigabyte hard drive with a staggering number of visitor recordings, I realized that there was simply too much data for one graduate student to organize.

My first suggestion was that we were going to need a team of people to organize all that data; then we began to consider ways to tag entries so they could be searchable.

Visitors' recordings are reviewed and captioned before being added to the Telling Lives video.

Meanwhile, even using these stories in the exhibition was becoming problematic because of the turn-around time in selecting and editing stories. It was decided that my role would focus on culling video stories to highlight emerging themes. Here is where I truly began to observe and listen. I was mesmerized by every recording: the speakers' tone, body language, dress; their gut-level responses; their criticisms, reflections, and free associations; their thoughts on modern New York, on America, on the world; even their stories about how they had heard of the exhibition.

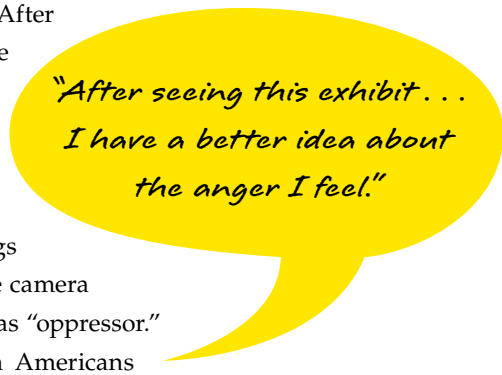
I also began to see the potential value of these recordings not only for researchers and historians, curators and educators, but for other museum staff as well. The public relations staff would be able to see what message techniques had reached this record-breaking audience, which media people were reading, how effective subway ads were in attracting visitors inside the gates. Visitor services could study demographics and audience backgrounds, scope out potential members, identify current members' opinions. The recordings could even be used to build a case that audiences crave exhibits that don't hide from tough societal issues, that museums can provide a safe space for collective debates.

The recordings were so information-rich and personable that I felt as if I had received a gift from every respondent. I was struck by the willingness of those who participated to open themselves up to the cold stare of the camera lens and the microphone. Maybe it was the anonymity of the booth that allowed the people such verbal and physical honesty. People took the process seriously and, I think, felt empowered that their voices and ideas were being valued. The exhibition was inviting them to be part of a difficult conversation. Even those who had negative reactions, or were angered after viewing the exhibition, appeared calmer after having the chance to "talk back."

I took notes on memorable recordings and, with Richard Rabinowitz and Lynda Kaplan, also of AHW, reviewed the videos and discussed emerging themes. From our meetings and watching came a descriptive shorthand that gave us a language to begin seeing trends and a lexicon for possible data organization.

There were people who expressed pride, gratitude, and hope. There were people who questioned their own preconceived notions, and others who made connections to the present. And there were people we thought of as "public processors," who talked themselves to new understandings of the racial dynamics of modern New York. Their ramblings and free associations were lacking in self-consciousness, as if their brains were constructing knowledge right on my computer screen.

And then there was anger. One recording stood out for me. A group of four young African-American male teenagers, wearing all the accoutrements of modern hip-hop youth culture, crowded into the booth and scowled at the camera. After a few minutes of expressing their anger about the subject matter, one of them said: "After seeing this exhibit I know now why I want to jump you when I see you in the street. I have a better idea about the anger I feel and why I sometimes feel violent towards you." While there may have been some posturing or theatrics for the camera, the statement speaks to me of the power of history in our understandings of our society and ourselves. In addition, this visitor addressed the camera as "you," placing the institution as "white" and to a lesser degree as "oppressor." This sentiment was not exclusive to teenagers, as many African Americans referenced the New-York Historical Society as a white or European-American institution and took the opportunity to speak directly to that perspective.



Composing

I downloaded some cheap PC-based video-editing software and set out to make mixes that represented these and other recurring themes, captured a diversity of perspectives, and reflected the level of thoughtfulness the audience was consistently displaying. The exhibition had opened with a 10-minute video of participants in a focus group held prior to opening. This was then replaced with our first mix of Telling Lives highlights.

When planning began for *New York Divided: Slavery and the Civil War*, I was contracted to create a series of four additional videos, one drawn from visitor reactions to *Slavery in New York*, and three from reactions to this new installation. By this point, I had the capability to edit these myself at professional quality and speed up the process of getting them onto the floor.

As I made the first video, I felt that that I was serving as advocate for the thousands of people who had been willing to give a piece of themselves to the exhibition and had spoken with such eloquence about this complicated topic and its contemporary consequences.

Like the Telling Lives story-capture booth, other exhibits in *Slavery in New York* and *New York Divided* invite visitors to share their views.

Talk-back culture: from monologues to conversations

This is what I've learned from my experience with Telling Lives: When you invite audiences to respond to open-ended questions, and take the time to listen, they can breathe life into exhibits and turn our work from monologues into conversations.

Some institutions hesitate to risk their reputations, curatorial voice, and bottom line to present politically charged subject matter. But these videos prove the audience can handle it, especially when they are invited into the process and allowed to share and value their meaning-making along with the institutional voice.

Ours is a talk-back, participatory culture. One warning rings out across all sectors of the educational and information fields, and that is: Gatekeepers Beware. The relevance of those who have traditionally controlled the flow of information is diminishing. But those who can understand how to nourish people's thirst for learning while providing a way to share that learning will be greatly valued both intellectually and commercially. Technology is making it possible for museums to more easily learn from their audiences and to create institutions that foster conversations instead of didactic lectures that alienate more than they serve.

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A Question of Truth: Writing Experience into an Exhibition

Phaedra Livingstone

Over the course of a museum experience, visitors will choose to respect, question, or reject curatorial authority, but the institutionally authorized text is only one disembodied voice in the mix when a visitor actually makes sense of an exhibition. The growing body of empirical research on visitor learning demonstrates the influence of personal interests, visit agendas, and interactions with visit companions on learning behavior; these factors, and others, will have an impact on which elements of the authorized story one notes. Finally, the texts of authors previously experienced, in or outside a museum, also join in the meaning-making conversation within a visitor's head.

Exhibit development is likewise a complex process of negotiating meanings that draws on many diverse sources. An exhibition is therefore never simply a self-contained curatorial text, but, to draw on Julia Kristeva's term, an "intertextual experience."[1] The process of changing practices to acknowledge that reality and share authority by design within exhibits is the shift we now need to embrace.

In this article, and the accompanying article by Erminia Pedretti and Barbara Soren, we share what we have learned from studies of the exhibition *A Question of Truth* about what happens when we deliberately allow casual visitors to write their own experience or critique into an exhibition.[2]

Visitor voices in *A Question of Truth*

The Ontario Science Centre opened the permanent exhibition *A Question of Truth* in November 1996. *A Question of Truth* is an unusual exhibition for a science center in a number of ways. First, it takes as its very abstract subject the question of scientific objectivity, and it outlines some of the historical consequences of social discrimination in Western science (i.e., the rationalization of slavery, racism, and sexism; eugenics; and the Holocaust). The content has three main themes: Frames of Reference, Bias in Science and Society, and Science and the Community. The 39 displays and the interpretive text are organized into five exhibit sections that relate to one or another of the above themes: Point of View, Health, One Race, Prejudice, and Community.

Second, *A Question of Truth* does not look or feel like other science center exhibitions. It is shown in a 465-square-meter space within the Hall of Communications, shrouded by black curtains and set off by an imposing gateway that does not give instant access. If viewing the exhibition as planned, one goes through the above five sections in sequence, guided by labels that use leading questions to invite visitors to

reflect on the exhibits they are about to see. These open-ended questions are not explicitly answered. Further, visitors are alerted to the intended curatorial message with large wall panels printed twice in English, twice in French, stating: "The goal of this exhibition is to explore different points of view: to question truth by challenging beliefs about differences between people and to show how those beliefs are part of the practice of science." These narrative strategies are unusual for science centers.

The curation of *A Question of Truth* also departed from the norm for the Ontario Science Centre. For the first time, a culturally and professionally diverse community advisory panel was consulted on both content and display prototypes. A large label by the gateway identifies the advisory panel members. Many other community voices are also represented within the various displays in the Community section. Dioramas were created through workshops with local schoolchildren. Audio clips and photographs of interviews with 25 scientists give a cross-section of perspectives on practicing science in Canada today, and the photos, audio, and stories of six other individuals demonstrate the link between accents and racial or class stereotypes. Videos produced by local street youth, disabled women, and community groups also present first-person narratives of experiencing social difference or discrimination.

Visitors are invited to give their feedback in the same section in which these community voices are found—at a video booth, computer station, and through handwritten comment sheets—with the result that the Community section operates as a sort of public forum.

While the abstract themes on the sociocultural context of science and the unanswered leading questions do disturb a small minority of visitors, interviews and written comments demonstrate that most visitors appreciate the antidiscrimination theme and the use of repetition to reinforce concepts across the exhibits. A number of visitors I

Although visitors to *A Question of Truth* also have the option of e-mailing or videotaping feedback, handwritten comments are more frequent. A selection is posted here to stimulate further discussion.

spoke with also referred to the community and visitor voices embedded in the displays as helping to reinforce the main theme. The choice to spend the extra time and effort to leave feedback is further evidence that the show is an engaging, if not always easy, experience.

Choosing to speak up

Given the choices available, how do visitors choose to inscribe themselves in *A Question of Truth*? The video-recording booth videotapes a few minutes of whatever a visitor or group chooses to perform for the camera. The visual nature of video conveys nonverbal communication and one's identity, and audio tracks bring the dimension of sound to the experience—making video a powerful medium of expression. In the many hours I spent conducting observations and interviews in the exhibition, however, I always saw the same four recordings displayed on the touch-screen viewer, and I witnessed very few visitors enter the recording booth.

Posting a sample of visitor comments for other visitors to read allows a dynamic interaction between the public and the exhibition.

The computer terminal allows access to the Internet, with links to various web pages related to the exhibition or the Ontario Science Centre as a whole and windows for sending e-mail comments to staff. I observed a number of visitors using the computer, but any messages they may have written are private. The potential for this communication technology to link a sole visitor to the thoughts of other visitors, past and future, through an e-mail list or electronic bulletin board was not applied in *A Question of Truth* but could certainly be developed to facilitate a public forum in some other exhibition. If participants are informed in advance that this is a possible use of their message, an added benefit to such an e-mail list is that postings also offer pre-entered research data for studying postvisit thoughts and recollections.

The comment station is positioned near the Scientists Speak Up audio clips and 68 posted visitor comments. Twenty-six prompting questions are listed on the writing desk. Handwritten comments are by far the most popular of the three feedback options, although it must be noted that only a small proportion of all visitors leave comments. The comments left do not provide a representative sample of all visitors but, rather, reflect those who felt moved during the course of their visit to voice a reflection. Posting a sample of visitor comments for other visitors to read allows, according to the exhibition's curator, a "dynamic interaction between the public and the exhibition itself."[3]

During the first eight months *A Question of Truth* was open, 3,789 comments were left. According to the findings posted beside the sample comments, 83.6 percent of these comments were found to be positive, 9.7 percent were negative, 4.4 percent were mixed, and 2.5 percent offered suggestions or corrections. Our meta-analysis of 3,365 of these comments demonstrated that expanding beyond the usual positive, negative, and

suggestion categories, one also finds comments reflecting on personal experiences and identities, reflecting on themes at a theoretical level, and related to specific displays or observations.

Very few visitors wrote comments responding to the questions listed on the desk; twice as many (2.4 percent) wrote comments speaking to the behavior or posted comments of other visitors, making them the more successful prompt. More authors (4.1 percent) wrote primarily about specific displays, with the few experiential ones clearly being found the most provocative, as they were intended to be.

In the case of *A Question of Truth*, I believe there are a couple of key reasons for these feedback preferences. Comment sheets are most accessible, both intellectually and technically, and are validated through the posting of selected examples within the exhibit. They also offer immediacy and the option of anonymity (nonetheless, some visitors gave full addresses and requested responses from staff). E-mail and video, on the other hand, do not offer full anonymity. The location of the computer and video terminals is likely also an issue. Both are tucked behind curtains in corners, while the comments are easily found in open areas.

As *A Question of Truth* illustrates, attending to visitor voices can involve providing meaningful activities in exhibits, which in turn validate the diversity in visitor knowledge and experience bases. At the same time, such activities will compile rich feedback and visitor-generated (albeit edited) exhibit content, which need not entail elaborate or costly techniques.

NOTES

1. "Word, Dialogue and Novel," in *The Kristeva Reader*, ed. Toril Moi (New York: Columbia University Press, 1986).

2. The two studies I refer to are Phaedra Livingstone, "Reading the Science Centre: An Interdisciplinary Feminist Analysis of Museum Communication" (Ph.D. diss., University of Toronto, 2003); and Phaedra Livingstone, Erminia Pedretti, and Barbara J. Soren, "Visitor Comments and the Sociocultural Context of Science: Public Perceptions and the Exhibition *A Question of Truth*," *Museum Management and Curatorship* 19, no. 4 (December 2001): 355–369.

3. Hooley McLaughlin, "Questioning Scientific Authority: *A Question of Truth* at the Ontario Science Centre, Toronto, Canada," *The Manual of Museum Exhibitions*, ed. Barry Lord and Gail Dexter Lord (Walnut Creek, Calif.: AltaMira Press, 2001), 475–78.

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Reflecting on A Question of Truth

Erminia Pedretti and Barbara J. Soren

Comment cards invite and potentially empower visitors to voice their responses and opinion about a museum exhibition. They are a useful but often underutilized source of information on visitor experience. In this article we report on the analysis of 3,365 visitor comment cards introduced in Phaedra Livingstone's article (pp.XX–XX). The comments were collected over a three-year period in the context of the Ontario Science Centre's exhibition *A Question of Truth*.[1]

The value of visitor comment cards

Analyses of individual comment cards have the potential to provide insight into visitors' ideological stances and critiques of an exhibition—in this case, on issues related to science and society. Comment cards also provide a rich source of information and important feedback for museum staff, particularly about the range of visitor responses to a particular exhibition.

To glean the most from visitor voices, however, analyses of comment cards need to be systematic and rigorous.[2] This process can be labor intensive from both quantitative and qualitative perspectives,[3] and museum staff rarely have the resources to analyze the data adequately and report on them. Because a self-selecting visitor population fills out comment cards, it is risky to make specific claims about individual experiences or generalize across all individuals who have visited or may visit the exhibition. Given the limitations of comment cards for representing a statistically valid survey of audience opinion (the goal for many evaluation studies), Andrew Pekarik poses an essential question: "What can be done with these hundreds of thousands of comments?"[4]

As visitors leave *A Question of Truth*, they have an opportunity to respond to the exhibition through video and/or comment cards (actually, blank, lined yellow sheets bearing the exhibition letterhead). Most who respond choose to write on the comment cards and leave them in a marked box. Staff members select some comments for posting on a glass-enclosed bulletin board at the end of the exhibition.

Table 1

"USEFUL" VISTOR COMMENT SHEETS (N=2,296)

CATEGORY	% OF TOTAL RESPONSES (N)
Key themes (Focus of Inquiry)	**23% (527)**
Social change	1% (23)
Bias	2.4% (54)
Truth	5.7% (131)
Diversity/difference/equality	6.2% (143)
Prejudice/discrimination/racism	7.7% (176)
Other meaning-making	**35% (811)**
Environmental concern	0.1% (3)
Medicine	0.3% (7)
Gender	0.7% (17)
Pondering/confused	1% (23)
Sexual innuendo	1% (23)
Responding to questions posted at station	1.4% (33)
Foreign language	2.1% (49)
Response to other visitors/comment sheets	2.4% (55)
Drawings	8.7% (195)
Scribbles	8.8% (205
Profanity	8.9% (205)
Comments on quality of exhibition/science center	**42% (958)**
Comments on science in general	0.5% (13)
Did not like exhibition	1% (23)
Omissions	1.5% (35)
Favorite displays	4.1% (95)
Educational	4.9% (112)
Liked exhibition	5.6% (128)
Suggestions/corrections	7.1% (164)
Science center generally	16.9% (388)
TOTAL	100% (2,296)

NOTE: Each comment card was analyzed for only one dominant category.

Comment card analysis

The research team began its analysis by reading all 3,365 comment cards several times and sorting them into categories and themes. We defined and negotiated codes and categories.[5] We divided responses into "useful" comments (2,296 or 68 percent of the total sample) and "useless" comments (1,069, or 32 percent of the total sample). The useless comments included primarily nonsense text (such as a few jumbled words, bravado notes to classmates, or indiscernible non-text) and blank sheets. We then reexamined, coded, and sorted the useful comments into further themes as they emerged from the data.[6] Table 1 summarizes the categories and number of responses for useful visitor comment cards. [7]

For the purposes of this article, we highlight visitors' voices from the three sections identified in the table. Almost one-quarter of the comments (527 visitors, or 23 percent) discussed key themes such as social change, bias, truth, diversity, and prejudice. For

example, "bias" comments included issues such as political correctness, objectivity, and pseudoscience. In the following comment, the visitor aimed to clarify a personal understanding of the nature of science while offering commentary on the potential bias of Ontario Science Centre exhibitions:

> I believe this exhibit is complimentary to the science centre because it shows how bias affects our interpretation of not only society, but science. Despite the common belief that science is objective it is based on assumptions. Assumptions and interpretation of scientific data are subject to preconceived notions and bias. In this sense, the exhibit might awaken people to biases that the rest of the scientific exhibits in the science centre are based on.

Some comments suggested explanations for discrimination:

> Prejudice is part of life because people are afraid of what they don't know.

> Discrimination is a disease of perception. One must be taught to hate. Education is key.

The question of "truth" prompted this reply from a visitor:

> Truly brilliant exhibit. Science in its most pure and crucial form, despite what some letter-writers may proclaim . . . "Truth" is the philosophical and physical quantity whose EXISTENCE requires the most examination today. I thought this exhibit was a pretty far-reaching discussion on this subject.

In contrast to the many positive responses to the exhibition, some visitors wrote more derogatory comments. Only 23 visitors (1 percent) wrote specifically negative critiques (i.e., "Did not like exhibition"). Some of their comments suggested that the exhibition was inaccurate, pandering to political correctness, inappropriate for a science center exhibition, or simply propaganda. Science center staff selected a sample of these critiques to post on the bulletin board along with positive feedback. Curator McLaughlin explained that the staff sought to select comments that were "positive about the show, but also some that were angry . . . A few were adamant that we had made some basic mistake to the interpretation of science and its relation to society; we had broken some basic rule of science."[8] Comments that conveyed some common misunderstanding about the theme of the exhibit were also selected for display. These misunderstandings provided opportunities for the science center to reiterate the exhibition theme. The selection of comments by science center staff was independent of our research categories.

Of particular interest were instances in which visitors responded to others' posted comments about issues such as science, truth, race, and equity. This sample of comment cards falls under the category "Other meaning-making," specifically "Response to other visitors/comment sheets" (55 visitors, or 2.4 percent).

Through this cacophony of voices we read about visitors grappling with the challenging issues and ideas presented in *A Question of Truth*.[9] Some of these replies were passionate and lengthy, and a few individuals identified their name, race, city where they lived, and/or occupation.

One visitor who responded to posted visitor comments on the practice of science and worldviews wrote:

> Having read many of the comments posted on the walls around this exhibit, I was very pleased to see the realm of open and closed-mindedness of people. From my own personal worldview, however, it seems awkward that so much Eurocentric (writing) prevails, rather than open dialogue and discussion. I am a member of the Metis Nation of Ontario and I have studied a little in Native worldview. Basically, my point is that "ORAL TRADITION" HAS BEEN SHUT OUT BY SCIENCE, STUDY, AND THE ALL POWERFUL WRITTEN WORD. I have participated in Pow wows and I have listened to many elders on matters relating to social "DISHARMONY." My realization is that science can be a good thing if and only if it is balanced by the natural forces of Mother Earth. We need to slow down the pace of society and listen to the rhythms of Nature so that we can truly understand who we are and where we are going.
>
> Thank you so much for a wonderful exhibit and the opportunity to VOICE.

This layered response speaks to the need for exhibitions and visitors to acknowledge the contributions of many cultures to our understanding of the natural world. Such perspectives recognize science as a human activity that is value laden and sociocul turally bound.

Another visitor responded to a written comment on racial difference:

> Referring to the 2nd message on the board from the top right going down. This human being believes that there are different races with different mental capabilities and are not equal. I (light skinned) believe that this sort of opinion comes from an unobservant and ignorant fool.

A Question of Truth has attracted people and educators interested in antiracist education. It attempts to portray science in an inclusive and authentic way, and thus it aligns well with recent calls for antiracist science teaching and multicultural science education.[10] One woman noted, however, that some visitors were using comment cards to further personal racist agendas. In response to comments posted, she wrote:

> What I've noticed, is that instead of this "post it center" being a place to express their logical and thought out review of this exhibit, it has become a breeding ground for full blown racists to reveal their hateful, tasteless ideologies . . . I am

> a young black female and it is about time someone openly came out and cleared up some of these issues. This exhibit is definitely a wake up call to all youths and its striking realism and honesty about some of the past and present issues will help to put an end to so many stereotypes. I hope that this exhibit remains permanent. All I am trying to say is that this exhibit will serve as an information center for those who are obviously ignorant and misled. Also this exhibit will hopefully become a "Health Centre" to cure those who are caught up in the cruel cycle of racism.

Although the subject matter is difficult and sensitive, we are encouraged by visitors' receptiveness to struggle with multiple viewpoints and value diverse perspectives. These visitors were ready and willing to engage intellectually and emotionally with the critical issues raised in the exhibition.

Reflection

In many ways, comment cards provide a window into the visitor experience and contribute potentially valuable feedback to science centers. In our study, systematic and rigorous analysis of comment cards helped us to better understand how individual visitors found meaning in an exhibition that confronts issues such as truth, prejudice, race, bias, and social change in relation to science and culture.

Furthermore, their comments provided overwhelming feedback about the appropriateness and need for science centers to tackle sensitive subject matter. The opportunity to voice opinions allowed for personal and social dialogue across diverse communities. As one visitor wrote: "This bulletin board is an excellent example of the discourse we need to keep our communities alive and civilized."

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NOTES

1. The exhibition was curated by Hooley McLaughlin. The authors are grateful for his enthusiasm and support.

2. Andrew J. Pekarik, "Understanding Visitor Comments: The Case of 'Flight Time Barbie,'" *Curator* 40, no. 1 (1997): 56–68; Douglas Worts, "Extending the Frame: Forging a New Partnership with the Public," in *Art in Museums*, ed. Susan Pearce (London: Athlone Press, 1995), 164–91.

3. Barbara J. Soren, "Qualitative and Quantitative Audience Research," in *The Manual of Museum Exhibitions*, ed. Barry Lord and Gail Dexter Lord (Walnut Creek, Calif.: AltaMira Press, 2001), 58–66.

4. Pekarik, op cit., 58.

5. Judith Davidson Wasser and Liora Bresler, "Working in the Interpretive Zone: Conceptualizing Collaboration in Qualitative Research Teams," *Educational Researcher* 25, no. 5 (1996): 5–15.

6. See Yvonna S. Lincoln and Egon G. Guba, "Paradigmatic Controversies, Contradictions, and Emerging Confluences," in *Handbook of Qualitative Research*, 2nd ed., ed. Norman K. Denzin and Yvonna S. Lincoln (Thousand Oaks, Calif.: Sage Publications, 2000), 163–88; Michael Quinn Patton, *Qualitative Research and Evaluation Methods*, 3rd ed. (Thousand Oaks, Calif.: Sage Publications, 2001).

7. For more detailed methodology and analysis, see Phaedra Livingstone, Erminia Pedretti, and Barbara Soren, "Visitor Comments and the Sociocultural Context of Science: Public Perceptions and the Exhibition *A Question of Truth," Museum Management and Curatorship* 19, no. 4 (December 2001): 355–369.

8. Hooley McLaughlin, personal communication, 2003.

9. For a more comprehensive study on visitor experience in the exhibition, see Erminia Pedretti, Hooley McLaughlin, Ronald D. MacDonald, and Wanja Gitari, "Visitor Perspectives on the Nature and Practice of Science: Challenging Beliefs through *A Question of Truth," Canadian Journal of Science, Mathematics and Technology Education* 1, no. 4 (October 2001): 399–418.

10. See, for example, Sandra Harding, ed., *The "Racial" Economy of Science: Toward a Democratic Future* (Bloomington, Indiana: Indiana University Press, 1993), and Derek Hodson, "In Search of a Rationale for Multicultural Science Education," *Science Education* 77, no. 6 (1993): 685–711.

"They said that the glass is full of friendship": Visitor Stories in a Memory Exhibition

Michael Pearce

In a science museum, when we want to show people some part of the natural world that is exciting or beautiful or strange, we try to present it with immediacy, concision, and transparency, so that they can quickly and directly experience the phenomenon. When we want people to consider some aspect of their own thinking or perceiving or behavior, we try to get them to both perform and observe that process in a way that allows them to notice some compelling (and sometimes strange or even beautiful) part of themselves.

In 1998, when the Exploratorium opened its new exhibition *Memory*, more than 50 exhibits engaged visitors in activities that provoked and challenged their memories. Our broad theme was the idea that memory is a supple mental and physiological process that selectively grasps, retains, distorts, forgets, revises, and interprets our experiences. Many of the exhibit elements were clever reprises of laboratory experiments that psychologists have concocted to demonstrate this dynamic and often counterintuitive nature of memory. But a few exhibits took audience involvement a step further by inviting visitors to share stories of the events of their lives.

Since memory is so closely connected to a person's identity—one's sense and story of one's self—it was important to us to examine that fundamental unit of autobiographical memory, the personal narrative. Three elements in the exhibition had as their essence the stories of visitors. Interestingly, each of these exhibits addressed not only a different aspect of memory, but a different segment of the museum's audience as well: visitors to the exhibition itself, visitors to our web site, and members of a community who became visitors in the process of creating an exhibit of their keepsakes.

Making history

On August 10, 1945, Yosuke Yamahata, a photographer for the Japanese army, arrived in the city of Nagasaki to document the damage from the atomic bomb that had exploded there less than 24 hours earlier. The photographs show a city devastated as if by prolonged, brutal, and indiscriminate warfare: charred bodies scattered among the incinerated rubble; medical workers and soldiers attending badly burned survivors who stare in bewildered agony; injured people walking stoically out of the rubble, sometimes carrying others on their backs. Many of the dead and injured are children.

In 1995 the San Francisco-based Independent Documentary Group, which had curated a selection of the Yamahata photographs, invited the Exploratorium to display

them on our web site for a 50th anniversary commemoration.[1] We had just begun planning our *Memory* exhibition. We decided to present the images in the context of an inquiry about war and memory, with a forum for responses from our web audience. Those of us working on the web project—in particular Susan Schwartzenberg, Marina McDougal, and I—saw the opportunity to examine several levels of memory: the collective, historical memory of the bombing itself; people's personal stories of learning about the bomb; and people's attempts to make sense of the bombing in the context of the larger sweep of modern history. Our focus was the interface between individual memory and history—the ways in which these two kinds of remembering reflect and interact with each other. In 1995 our web site was still in its infancy, and this was the first project we did that was built around audience response. We had no idea what that response would be.

It turned out to be extraordinary. The number of weekly "hits" tripled in the first month that the exhibit, which we called Remembering Nagasaki, was online.[2] Hundreds of people wrote in, often eloquently, with their remembrances of learning about the bomb and their thoughts about its historical meaning. The response came from a diverse range of people, including victims of the Nagasaki bombing and the son of a crew member on the plane that carried the weapon.

The mosaic, collective story that emerges is complex and often contradictory; it is also a moving, disturbing, and ultimately edifying document about memory and its aggregate offspring, the contentious narrative of history. Many—probably most—of

Remembering Nagasaki was accessible online and from the museum floor.

the respondents reveal a sense of how their understanding of this chapter of history deepened over time:

> When the war ended, my sister and younger brother and I marched around the block in Detroit making a commotion by beating on pots and pans. The kids next door from second floor bannisters let fly wads of spit . . . proclaiming "This is for the Japs. And this is for the Germans." And we all smiled and laughed. We were glad the war was over for it frightened us. It also meant that our uncles, segregated in the Army and discriminated against in the Navy, would be coming home. Beyond that, we had no idea what those August explosions meant.
>
> —Gerald Lundy

Although the bulk of the writings came from Americans (who, especially in 1995, made up most of the Web's users), the response was international, providing diverse perspectives:

> I knew about the bomb attack from elders, when I was a child of 6 or 7. For me the atom bomb was a big cracker like thing, at that time. I therefore admired the US for making such a great thing. Later when I saw the pictures, got to know more about it from books and publications, I really felt sorry. I feel that, what happened was some thing should [sic] never have. I would also like to impress upon the administrators that, it is their prime duty to ensure that such a tragedy will never happen in the future.
>
> —Binto George, Age 25, Indian Institute of Science, Bangalore, India

Many of the writers acknowledged not just the horror of mass warfare, but the immense responsibility of wartime decision making, where any choice can result in death, pain, and destruction. The seriousness with which writers grappled with the profound complexity and nagging ambiguities of multinational warfare still moves and astounds me:

> My name is James Seo and I'm a 23-year old Korean. . . . Attending grade school in Korea I was taught only of the horrors of the Japanese occupation of Korea before and during WW2. Of the atomic bombings all I knew was that they had put an end to the war—and that the Japanese deserved it for all their sins in Korea and other places. . . . As I grew up, I learned more about the war as well as the bomb's effect on not an abstract evil nation but the daughter and the mother left clutching rice balls in burned cities. Yet when I view these pictures or see shots from movies showing nuclear holocaust for a long time I've had trouble reconciling the lessons I was taught as a child and the conclusions I'm trying to arrive at as an adult. It's a difficult process and it's easy to pity these victims, it's easy to mourn or blame or feel sorry. I'm more interested in the thorny questions

of relative justice, distortions or omissions of history, interested in what mix of feelings these images bring out in me. And I thank the exhibit for doing that, for providing an arena full of burning ruin as it is for my thoughts to roam uneasily.

I have seen a photograph of Yamahata taken before the war, and one taken a few years after. The comparison is heartbreaking—a young, hopeful, even cocky man who has recently completed his education, looking ahead to a life full of promise; and a man slightly older but still young, his eyes absent of innocence or joy. This pair of photographs represents to me the legacy of the bombing of Hiroshima and Nagasaki that we have all inherited. I see Remembering Nagasaki as a tool for exploring that legacy, and the burden of memory—individual and collective—that it imposes.

The early years

The pioneer developmental psychologist Jean Piaget told a wonderful story about memory (a story that, had it been read widely, might have saved some veterans of the "memory wars" of the '80s and '90s a lot of trouble). When he was not yet 2, his nanny took him out along the Champs Elysées in his stroller. She returned dissheveled and upset: A kidnapper, she sobbed, had tried to take little Jean from her, and she'd had to fight the man off. The story became part of family lore. Jean himself had a vivid memory, which he recounted to family and friends many times, of witnessing the incident from his pram. Then, some 14 years later, the nanny, who had joined the Salvation Army, wrote the family a letter confessing that the entire event was a fiction. Piaget marveled at how this family story of an occurrence that never took place became internalized as his own memory—a memory whose images he could still call to his mind's eye decades later, long after he knew it was false.[3]

We used the Piaget story as a kind of motto on our exhibit Earliest Memories. The exhibit was simple: Visitors were invited to write down the earliest event in their life that they could remember. They were also asked to give their present age, their age when the childhood event took place, and some speculation (in light of the Piaget quote) about whether the memory was accurate.

I still have the clothbound journals we placed in this exhibit. Our visitors filled up six of them, 300 pages each, with as many as three or four entries on a page. There is, of course, some scribbling and doodling, and some blank pages, but the books are stuffed with responses that are both sincere and thoughtful. They are also, by turns,

engaging:

My brother made me swallow pennies because he said it would make me worth more to our parents.

unsettling:

I don't remember anything until I was about 8 or 9 because something in my childhood caused me to block everything out.

chilling:

I remember the smell of cigar smoke and seeing bits of food caught in my uncle's mustache as he kissed me in places one ought not a young girl of 3. I remember the sting of the bacteen used to clean the cut on my po po and my mother crying. "It's okay mama, don't cry" I told her.

unlikely:

My earliest memory—I'm pretty sure it was real—was my dad saying "hi Katie" a lot. I was in my mom's belly. I only saw reds—pinks.

strange:

I remember watching a fish heart beating on a cutting board. I must have been 2½, it was in a summer cottage and my grandmother had cut open the fish.

funny:

One of my earliest memories was asking my father about the validity of the Santa Claus scam. He rolled over from sleeping and said, "There is no Santa Claus, there is no Easter Bunny, and there is no God."

painful:

I remember being locked in an abandoned, wasp infested trailer at age 4 by my older sister who coaxed me there by telling me there was chocolate cake inside. I didn't get out for 6 hrs.

and revelatory:

One evening when I was being put to bed, I suddenly realized what the alphabet meant. That was like a nuclear bomb going off in my head—the impact was of such great magnitude!

Some—fewer than 20 percent—grappled with the question of accuracy:

I remember (I must have been 3 or 4 yrs. old) in the Philippines when my brother's bed caught on fire from a faulty A/C. I ran into my parents' room to tell them. I vividly recall it. My parents (and my brother too) tell the story a much different version. They say I slept through the fire—who knows? —Kerry, 27

"I remember ME."

I make no scientific claims, but I did notice that first memories from when the writer was younger than 3 tended to be rather unpleasant or even traumatic; earliest memories of a more pleasant or simply quotidian nature showed up a year or two later in childhood. It seems a reasonable hypothesis that more emotion-laden memories, particularly negative ones, are more deeply encoded, and that there may be survival value in this.

In any case there seems to be something important, perhaps even defining, in our earliest memories. If memory is, in large part, the crux of who we are, our very earliest memories in some ways mark our beginnings as people, a time of awakening from a more undifferentiated state of awareness and coming into a discrete, autonomous sense of ourselves. Reading the entries in this exhibit is like reading the first entries in hundreds of diaries; for me, a subtext of many of these narratives is a simple, emphatic "I remember *me*."

Obscure objects

During the time we were developing *Memory*, conversations often turned to the ways in which we identify certain physical objects so strongly with a place or event of the past that they become imbued with a kind of talismanic power. At one meeting, team members brought in memory objects and told their stories. Melissa Alexander and Veronica Garcia-Luis determined to create an exhibit entirely of these objects, displayed with short narratives about their significance. They worked with groups from English classes for recent immigrants, who brought in objects and wrote about them, both in English and their native language. Nearly all the students in the classes that Melissa and Veronica worked with participated enthusiastically in the project and brought friends and family to the exhibition's opening.

The objects were displayed in vitrine cases, alongside their respective narratives, like "fine art" or anthropological artifacts. The exhibit, entitled Mementos, was included in a section of the exhibition organized around the theme of autobiographical memory,

along with the Earliest Memories exhibit and a multimedia piece about the artist Franco Magnani, an immigrant who paints his hometown in Italy from memory.

For people separated from the place and culture of their childhood, memory has a heightened significance. The writings in Mementos eloquently showed the special importance of objects from a faraway homeland, as well as a more universal longing to hold on to and cherish the past. Nearly all of the objects reminded their owners of particular people, friends, or relatives separated by distance or death.

> This ring is my best and special thing forever. Because when I see this object every day, I remember my grandmother. Why she gave me this object? Because I was special for her, she loved me more. The ring was very special for her, because inside the ring it has the picture of King of Ethiopia. So the ring was a memory object for her too. So she promise to me to give me this ring. The ring has more than 100 years. But she gave it to me five years before when she died. So this object has meaning to me, so I don't lose or break it. —Tsega Habtemariam

> I have a beautiful glass. The glass is created in Chinese style. The outside of the glass is decorated by very traditional Chinese words. The background is some painting of angels. I got this glass from my friends on the day that I was leaving from China to America. That day was a school day. I already told my friends "don't come to see me off," but what a surprise to me my friends decided to come finally and they brought this little glass with them. I remember they said that the glass is full of friendship and wishes, it's more valuable even than a diamond. So I accept this beautiful gift and carried it by hand on the train and plane. Because I don't want it to have any dust or be broken at all. —Zhicong Liang

Reflections

In a bustling carnival of a science museum like the Exploratorium, most visitors come in to mess around with cool kinetic stuff, not to look inside themselves. Research shows that, at least in some cases, when people operate an exhibit that demonstates an aspect of their visual system, they look for an explanation in the gadgetry of the exhibit rather than in the workings of their eyes and brain.[4]

One way to move people from the mind-set of exploring the world "out there" to observing their own perceptual and cognitive processes is to present them with an explicitly introspective activity. Writing about your own life is radically different from interacting with floating beach balls and spinning water. I suspect that those visitors who wrote about themselves or read the writings of others in *Memory* were a bit more inclined to introspection in some of the other elements in the exhibition. They were, in any case, directly experiencing an important and not fully understood aspect of human memory: the fundamental process of storymaking, which shapes how we perceive, respond to, and understand the events of our lives.

In a busy, noisy science center . . . reading at length is difficult; writing with much concentration of thought is very difficult indeed.

Another challenge in a busy, noisy science center is the attention span of visitors. Reading at length is difficult; writing with much concentration of thought is very difficult indeed. It is no surprise that, of the three exhibits where people were invited to write extended narratives (there were others where visitors could leave Post-it notes), only one (Earliest Memories) asked visitors to sit down and write inside the museum itself. The writings in the other two exhibits were done in more serene settings, and the resulting narratives were longer and more carefully crafted.

When the heart of an exhibit is visitors' comments, you get what you get. Which is to say that a certain amount of trust and tolerance is required—trust that most visitors will respond intelligently and sincerely, sometimes hilariously or profoundly; tolerance for the occasional defiant kid or cranky adult who scribbles something mean or obscene or totally off the point. Then again, such an exhibit is populist and somewhat free-form by its nature. And that is the point, isn't it?

MICHAEL PEARCE co-directed *Memory* and directs the Exploratorium's *Mind and Learning* project. A traveling version of *Memory* is still in circulation.

Remembering Nagasaki: www.exploratorium.edu/nagasaki/
Earliest Memories: www.exploratorium.edu/memory/earlymemory/index.html

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NOTES

1. Prints of the photos were displayed, simultaneously, at Chitose Pia Hall in Nagasaki, the Ansel Adams Center for Photography in San Francisco, and the International Center of Photography in New York City.

2. The number of online visits increased from 90,000 to nearly 300,000 per week.

3. Jean Piaget, *Play, Dreams and Imitation in Childhood* (London, Heinemann, 1951), 187–8 (footnote).

4. See, e.g., Katherine Whitney, "Seeing 3—Exhibit Pre-Post Interview Study Final Results" (an independent exhibition evaluation, 2003). Available from the Exploratorium, 3601 Lyon St, San Francisco, CA 94123.

What's Going On? Making Sense of the Vietnam Era

Barbara Henry

My dad being a geeky hippy! Peace out!

I 'died' in Vietnam in Cuchi, 1970. My body just doesn't know it yet.

Iraq is Vietnam on speed.

A cacophony and chorus of visitor voices, stories, and memories created a significant presence in the exhibition *What's Going On?—California and the Vietnam Era*, organized and presented by the Oakland Museum of California from August 2004 to February 2005. As the exhibition was developing, I listened to many horrific stories of the human spirit, only to find those experiences magnified further when visitors expressed their painful histories, their traumas, and their unanswered questions in the visitor comment areas.

In a pivotal moment for me, I observed one man grasping a visitor comment card written by a veteran. He excitedly read its contents to his companions and declared that this was a card he needed to keep. As he slid it into his pocket, I wondered if I should stop him, so that other visitors could read it too. But I held back, taking in the depth of the card's meaning for this visitor, who felt so strongly that he wanted to keep it as a memento. It was then that I realized how invaluable visitors' voices are for experiencing meaning-making and the human connection in our exhibitions.

What's Going On?, the first exhibition of its kind to examine the impact of the Vietnam War on California and American life and culture, explored this era from the perspectives of veterans, anti-war activists, war supporters, and Southeast Asian refugees. Marcia Eymann, then curator of historical photography and *What's Going On?* project director, engaged scholars across the country in developing the exhibition. We consulted government agencies, immigration centers, and veterans' groups, and through colloquia, focus groups, and community forums and advisory council meetings, engaged diverse individuals in exploring the era's complexities.

This was a controversial exhibition because of the war's unresolved outcomes and the deep wounds still widely felt. No exhibition had attempted this topic on such a scale, so the people who lived this history or were significantly impacted by it were very invested in how the era was interpreted. Another factor that contributed to the controversy was the exhibition's contemporary context. The development of the exhibition had begun years before the United States entered into the war with Iraq. But in 2004, as we wrote in our report to the National Endowment for the Humanities, a major supporter,

Another dimension came alive as visitors' journal books and comment cards pulsed with their reactions, questions, dialogues, and pleas.

"The invasion of Iraq and continuing occupation drew public attention back to many of the issues, arguments, and still open wounds of the Vietnam era. This served to fuel media attention to the exhibition, even before it opened, and also affected the public's reaction."

Since one of our goals was that visitors would become aware of a diversity of perspectives, personal stories were integrated throughout the exhibition. It was impossible for museum staff to include all points of view, given the complexity of the era, but another dimension came alive as visitors' journal books and comment cards pulsed with their reactions, questions, dialogues, and pleas.

The Listening Room: A place for personal stories, reactions, pleas, and prayers

About a third of the way into the exhibition, visitors encountered the Listening Room, a space that offered emotionally charged stories of the war in an audio guide format inspired by the listening environment in the United States Holocaust Memorial Museum. Unlike the rest of the exhibition, this space was modest, featuring comfortable seating and photographs of the people who were describing their experiences. This welcoming contemplative space provided an opportunity for visitors to process what they were experiencing, and journal books provided a place to share personal stories and emotions, respond to each others' contributions, and comment on the exhibition.

Some people used the journal books to express concern and frustration with current events or still unanswered questions about the Vietnam era. These deeply personal accounts reflected a confluence of the private worlds of our visitors with the public arena of the museum as it presented a global historic experience.

VETERANS AND THEIR FAMILIES RESPOND

An exit survey confirmed that discovering the soldiers' experiences was one of the highlights of the exhibition for many visitors. These perspectives were often expressed through journal accounts of visitors who were veterans or veterans' family members.

There were messages about pain:

> US.N FN 1969-1972 I still cannot tell my story today. The pain is too much.

about the madness of war:

> As an Ex-Marine Vietnam Vet (1968) I saw a bizarre condition of human nature in Vietnam. Being ammo truck driver and gunner on 155 howitzers I didn't go into the jungles like the grunts nor did I see the blood shed directly. What I saw among my fellow marines was an extreme desire to 'survive.' To get through your

tour and get home alive. . . . We were determined fighters, and good ones, but not for America, not for Vietnam but for ourselves. Survive! And then get the Hell out of here. We got home and people hated us for we didn't give a shit, but we survived! Iraq is the same thing but for no good reason. End war forever. USMC

and about duty:

. . . I chose to honor the system in 1966—was inducted in Oakland—not 6 blocks from here—went to An Khe, Vietnam Nov. 66–Nov. 67—1st ir cav. My memories are vast—objectively most people were apathetic—maybe the peacenicks are still suffering guilt. I'm proud of doing my duty.

One veteran wrote a 4-page message to his fallen buddies, from which this quotation is excerpted:

. . . they wouldn't let you open fire, and then you were overrun—your last transmission was "there's too many of them—they're all over us." . . . You were alive when I got to you. You died while I was lying on top of you—When the medic arrived and said you were gone I made him give you mouth to mouth recesistation—I can still see him shaking his head with your blood all over his mouth. . . .

A sister sought answers about her two brothers:

My Brothers—What Happened?

In 1967 my eldest brother J left home for Vietnam. Before the war J was a soft-spoken easy going guy. Once while on furlough home, J said he had killed people and was nearly killed in battle. After the military discharged him, J. became cold and withdrawn. Once he punished me for failing to wash the dishes by forcing my hand into the dirty dish water. Another time he punished me by making me kneel in a corner facing a wall—I had to kneel on raw grains of rice. As I knelt in the corner I cried because the grains of rice hurt my knees so badly. At the same time I wondered why my brother had become so cruel.

In 1968 my second eldest brother S volunteered for the army and was sent to Vietnam. S said he volunteered for the medical corps so that he would not have to kill people like J did. Upon returning from Vietnam S moved his family to Ca. and started a medical business. However about 8 yrs later S became cold and distant with family members.

Today neither S nor J communicates with me. I am not sure of the reasons why. On September 5, both J and S will celebrate their birthdays. I do not know where to send birthday cards. I have come to this exhibit to try to understand their Vietnam experiences. I just want to know what happened to my brothers?

Thank you.

VISITORS RESPOND TO EACH OTHER

Visitors also provided support to one another in trying to understand their reactions:

> Very emotional—A few smiles on my face, but mainly sadness almost to the point of tears—not really sure why I came here or even why I haven't left.
>
> —66–67 (196th)

Another visitor responded:

> . . . I handed out leaflets against the draft in Oakland & Chicago. I protested the war. But I never was against the soldiers who fought in the war. I respected all people—our soldiers, the Vietnamese people, our protestors. I was just against the corrupt system that put our soldiers in that war, in that position. We were all victims. . . . I am too brought almost to point of tears (reference to 66–67 196th). Why do we come here? (to this exhibit) Why is it hard to leave? We are trying to make some sense of (the) war—soldier and objectors. We are trying to heal.

"We are trying to make some sense of (the) war—soldier and objectors. We are trying to heal."

While the exhibition did not cover the war in Iraq, visitors clearly made the connection between the two eras and used the journals to express their views, often against the backdrop of their Vietnam era experiences:

Here three people shared thoughts about war then and now:

> I was a young Berkeley mother then—troubled, frightened & yet wanting to trust in the decisions of my government. My Chinese parents lived in Saigon till '62—today they are able to state that without a doubt we (the USA) were up to questionable good in that part of the world, way before the official war broke out. I feel so very betrayed. And it is déja vu today in Iraq. Pathetic—no lessons learned.

Below the page, another visitor commented:

> Right, no lesson learned by the Bush gang. You can't learn from history if you don't believe history, which is the conservative/reactionary attitude regarding Vietnam. America still hasn't acknowledged that it lost the war. The myth of American righteous lives on in the 21st century. Alas!

A third visitor responded on the next page:

> In response to many of the people claiming that Iraq is a repeat of Vietnam, I disagree. We are working to protect the freedoms of the American people and provide safety for the world. We are not working to preserve colonialism and democracy as we did in Vietnam. . . . —Sincerely, High School Senior Age 17

Visitors also used the journal book to invite dialogue with other visitors:

> I am a Vietnamese American 20 years old. This is my second time at this exhibit. The first time I was here, I cried and the information was overwhelming. Currently, I work as a Southeast Asian community activist while simultaneously being a student at Cal. I'm still trying to understand the effects of the war which has surrounded my upbringing all my life. This exhibit gives me more pieces to add to a puzzle of artifacts, remnants, and information that either make this war more comprehensive to me or more comprehensively complex. I am here to collect observations that will lead to an analysis of this exhibit for my Asian American stds class. Anyone whose interested in sharing their critiques of this exhibit, discussing the politics of SEAN-American today, or finding out more about my research can email me.

Some visitor entries were pleas and prayers:

> I've been marching in peace protests since the 60's. . . . All the personal friends or lovers from that era, were so emotionally wounded. Their guilt over killing people, killed their own souls. They came back, but drank smoked or coked themselves to death. . . . I was raped by another guy who I wrote letters to while there. It was like an animal came back. . . . I know my "sisters" of this generation are going to go thru this when the men from Iraq start returning & the violence to women goes up again. . . . Wake up. Keep protesting.

> Having someone in the Airforce (M.P.) unit in Iraq & Bosnia, I fear everyday for his safe return. He is only 24 years old, married & 1st child is due soon. Please God let him be a father to experience a life filled with joy raising his son and enjoying his family. Our prayers are with all our troops (sons, daughters) that our desires of our hearts—Peace will overcome. —Love Mom & Dad

A public gathering space: feedback comment cards

As visitors exited the exhibition they had another opportunity to reflect, respond, and share their voices on comment cards that were sorted by museum staff and displayed in a wall case. Visitors spent time reading and comparing responses, often commenting to their companions on what they were reading. It became a public gathering space with many different views shared in the posted cards and in the conversations of visitors reviewing them. This public dialogue changed throughout the run of the exhibition as the cards were rotated.

An important aspect of this response area was that cards were posted in a large high-quality case, which spoke to how they were valued by the museum. The case size allowed people to read, write, and converse simultaneously.

Provocative artifacts and displays prompted heartfelt comments from a diversity of visitors.

We assumed this would be an effective way to conclude the visitor's experience, but the value of this feedback area became more evident when we discussed our plans with some members of the Vietnamese community before the exhibition opened. They raised concerns regarding whose stories were going to be told. Many wanted to articulate the experiences that had led them to become political refugees. During a community meeting in Little Saigon, Orange County, I was surprised to see their concerns somewhat allayed when I described this visitor feedback section. The elder members nodded their heads in support of a place to share their perspectives. To my surprise, the feedback area was mentioned in a newspaper article covering this community meeting and the controversy around the exhibition.

Each card included one of six different prompts below, written in English, Spanish, and Vietnamese. The prompts that invited personal comments—especially those "in honor of" someone—seemed more successful in drawing responses from visitors.

In honor of . . .

I've been to the Vietnam Memorial in D.C. I've run my hand over the thousands of names. All those people are now just memories and names on a wall. So I'd like to write this card in honor of everyone of those people. Every single one.

The Vietnamese, Cambodian & Laotian people who lost their lives because they were in the wrong place at the wrong time.

THE MEN OF NOVEMBER PLATOON CO. "D" ½ 1ST INFANTRY DIVISION WHO WERE AMBUSHED MARCH 9, 1969. I THANK GOD I SURVIVED THAT NIGHT PHYSICALLY & MENTALLY – RIP-BROTHERS! 'MAJOR'

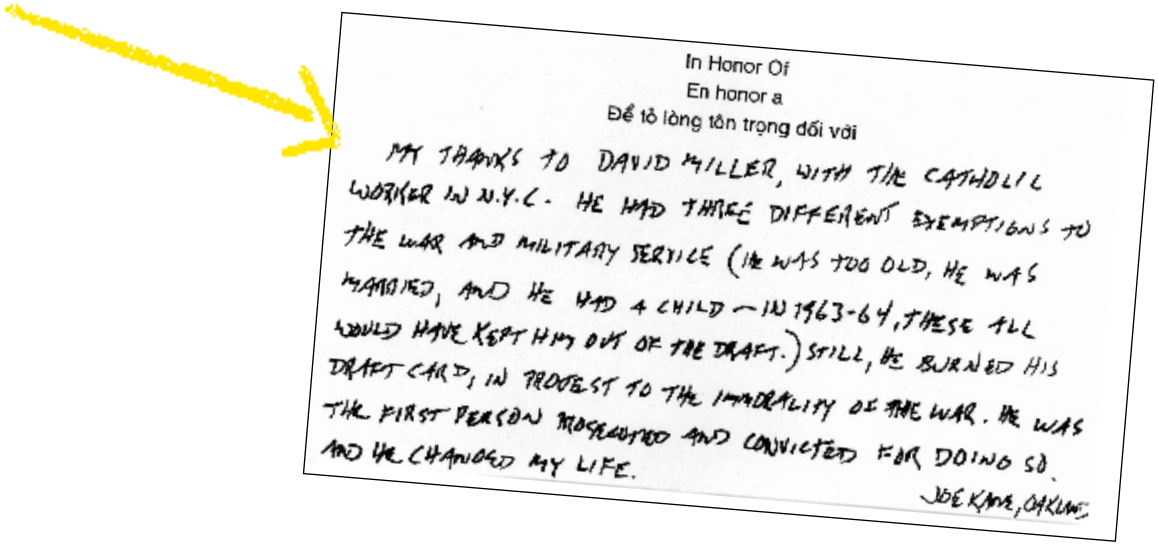
Every person who was never the same again.

This exhibition reminded me that . . .

My earliest memories were of the war. It seemed permanent to me. I remember peeing with my dad, standing, and he threw his draft card in the toilet and we tried to sink it. He told me to always remember this. And I have.

People in the country (and others) spoke out about what was wrong (war) & what was right. The exhibit transplanted me back to my teens, helping me to remember my core values and beliefs that remain with me to this day. Thank you!

Life can be taken for granted and that as each day passes we should all remember that nothing lasts forever. Make it count.



What do you want to tell your friends about the exhibition?

I want to tell them this is a thought-provoking exhibit about our past. I will now ask my parents about their experience fleeing Vietnam.

It's a must to understand a significant period of history—but a big caveat is that it does Not give voice to the experience of Vietnamese, NLF and otherwise—which fought the terrorism of the US intervention and their So. VN supporters. Subconsciously this exhibit still 'blames' communism and not US imperialism.

Go and see it. Bring tissue. Do not be afraid to witness. Do not be afraid to remember that we live in a similar time, yet without a similar resistance. If we forget we are really in trouble. So go and see it. Don't be afraid.

What image of the Vietnam era stands out in your mind now?

The baby lift . . . all of those wee babes strapped into stationary boxes—Vietnamese, 'amer Asians' alike . . . the translated letter of a mother letting her child go . . .

BATTLES, EXPLOSIONS, DEAD & WOUNDED ON TV DAILY.
Dr. King & Robert Kennedy Jr. both reminded me of the irreversible loss to America. I do believe the United States would be a far better country with justice and equality for all people. If only these two men lived.

The strength of veterans holding on and trying to find their place in a country that doesn't support them.

What did you learn about California and the Vietnam era that you did not know before?

I learned that SE Asian refugees, victims of the 'American War' (as it's called in Vietnam), went through many obstacles to arrive safely in the United States. I had not realized the large role California played during the length of the conflict.

I didn't really know how slowly our country stepped into this war. Like stepping into quicksand. I also liked how the exhibit linked the international student movements, civil rights, the war, and the cold war mind set. P.S. Where did you find my old school desk?

I didn't understand the impact of something so many years ago, could still break my heart and bring tears to my soul.

What questions do you have after visiting this exhibition?

Aren't we heading into our next Vietnam era (with social conflict) just like this one?

What do younger Vietnamese-Americans think about the war now?

It cannot be said too many times—WHEN WILL WE EVER LEARN?

Visitors bring honesty and bravery to an exhibition

Visitors' stories contributed to the exhibition narrative, and the distinctive voices in the journal books and feedback cards were reflected in part by the ways visitors chose to write their reflections and comments. Thumbing through a journal book or scanning a glass case of comment cards, I saw a range of personalities and emotions emerge in the handwriting. Some screamed for attention with large and energetic cursive, while others drew me in with their small and precise lettering that seemed so private. The writing gave texture and character to their many voices.

The visitors seemed quite forthright in their reflections or consternations. One had the sense they were opening up their souls, perhaps for the first time, regarding the impact of this era in their lives. Their comments animated the exhibition and in palpable ways revealed how history is us, shaping our own experiences and trying to figure them out as we continue on with our lives. Maybe that is why that one man took that comment card written by another visitor before it could be enshrined in our case.

After reading so many personal journal entries, I was struck by the simplicity and power of one entry—a pencil drawing of an eye with a large falling tear. Above the eye, the visitor had written: "The tears are done" and below the eye the message continued with "Time to smile!!!" I couldn't help but wonder if this visitor, moved by the deeply personal accounts in the preceding pages, was offering a ray of hope to counter the anguish felt by fellow visitors.

BARBARA HENRY is chief curator of education at the Oakland Museum of California.

Darkened Waters: Let the People Speak

Mike O'Meara

On March 24, 1989, the fully loaded supertanker *Exxon Valdez* impaled herself on a reef near Bligh Island, off the Alaskan coast, spilling almost 11 million gallons of crude oil into the pristine waters of Prince William Sound. That tragic event changed lives and redirected government and private institutions. Out of the chaos and controversy of this troubling experience, the Pratt Museum created *Darkened Waters: Profile of an Oil Spill*, the only comprehensive exhibition to document the nation's worst tanker accident and its aftermath.

Documenting the spill

A brief reminder of the scope and intensity of the event is in order. The *Exxon Valdez*'s grounding caused the United States' worst oil spill, in terms of the miles of shoreline contaminated, the number of birds and mammals killed, and the amount of money spent on cleanup efforts. For two years, area fisheries were disrupted, and the economic and social structures of some 17 coastal communities were thrown into disarray. The oil was never contained, and it eventually contaminated large and small stretches of shoreline along more than 600 miles of Alaska's coast.

The original version of *Darkened Waters*, built in eight weeks.

Three days after the grounding, spill response plans had failed, and winds and currents began moving oil through Prince William Sound toward the Gulf of Alaska. As the oil moved toward our community of Homer, Alaska, local people were frantic to do whatever they could to stop or clean up the oil and protect the fisheries. Anxiety and a sense of isolation heightened their frustration and fatigue.

News got out that the Pratt Museum was trying to pull together an exhibition on the spill. People started showing up to see what we had in mind and to let us know what was on theirs. They wanted the exhibition to be a place where they could come for up-to-date information, and they wanted it to include the stories, information, and artifacts they brought back.

In spite of the chaotic conditions, the original exhibition was completed in approximately eight weeks by Pratt Museum staff, with help from many volunteers, on a shoestring budget of $13,600. By early June 1989, even as we were putting the finishing touches on the exhibition, people began to jump the barriers barring entrance and

deluge us with questions. By the time we were officially opened, word had reached far beyond Homer, and people were coming to town specifically to see *Darkened Waters*.

Because the topic was both contentious and emotionally wrenching, the museum's usual visitor comment cards were supplemented with a special comment book so that people could have some constructive way to respond. Still, none of us had anticipated the depth and intensity of public reaction. This statement from Judy Lehman of Anchorage, dated June 23, 1989, is the first entry in the first of many *Darkened Waters* visitor-comment books:

> This exhibit should travel throughout the state of Alaska and the rest of the U.S. to show the devastating story of how we treat our environment.

In the following days and weeks we were confronted again and again by the same clear message:

> Take the exhibit as many places as you can—what about Australia?

> DO take your display on the road to High Schools, Universities and Museums & Nature Centers throughout the lower 48. The people want to know what has happened and need to get the information to understand the full scope.

As a small, regional museum with a full-time staff of three, the Pratt had never contemplated such an undertaking. The idea of using the original *Darkened Waters* exhibition as a prototype for such a major project was staggering. But visitors were throwing money at us and demanding that we step up to the plate. At the same time, the impacts of the spill continued to spread and worsen. There seemed no end in sight. After much consideration, the museum's board of directors voted to follow the visitor mandate.

Sharing the story

The effort of creating an exhibition suitable for a national audience dominated everything at the Pratt Museum for over two years. There was an enormous learning curve and an unprecedented fund-raising challenge during this time, but as we worked to complete the traveling exhibition, our visitors kept urging us on. In response, the museum mounted a traveling exhibition that toured the country for 11 years (1991–2002), showing at 17 venues in 10 states. It brought the story of the spill, animated by the ideas and words of those caught up in the catastrophe, to over 2 million people. Development and circulation of the new *Darkened Waters* exhibition was ultimately supported by grants from over 14 foundations, conservation organizations, and government agencies along with numerous contributions from businesses and individuals.

Visitor input remained an important part of the *Darkened Waters* exhibition as it traveled the country and went through periodic updating. The exhibition deals with an emotionally charged topic replete with contentious ethical, legal, social, political, environmental, and economic issues. Strong feelings are generated in many people as

they experience the spill through the eyes of those who lived it. Visitor comments from all venues remained remarkably similar over the years. The great majority of visitors expressed approval and support for the exhibition, commending it for a thorough and balanced approach. Far fewer, probably less than 5 percent, seemed to find the presentation biased or offensive:

> Never fail to be affected by what you've done here—please keep it alive, updated and traveling so EVOS does not become a dim memory. (1993)

> The exhibit is biased and emotional—rather than factual presenting both sides. The only reason it's such a tragedy is because it's in your back yard and you're capitolizing on the publicity. Look at the globe and put this little black spot in it's proper perspective. (1998)

People frequently responded to comments left by others, sometimes writing directly on the previous message, as in the case of the following negative entry and its three rejoinders, dating from 1991:

> You are telling nothing but your biased feelings.
>
> Do you think Exxon gets real statistics?
>
> This is what happened!! I'm an Alaskan!
>
> This seems less biased than most. See the Exhibit at UAF (donated by Exxon).

While comments often reflect sadness, anger, grief, and frustration, others indicate that visitors have been inspired to some kind of personal action:

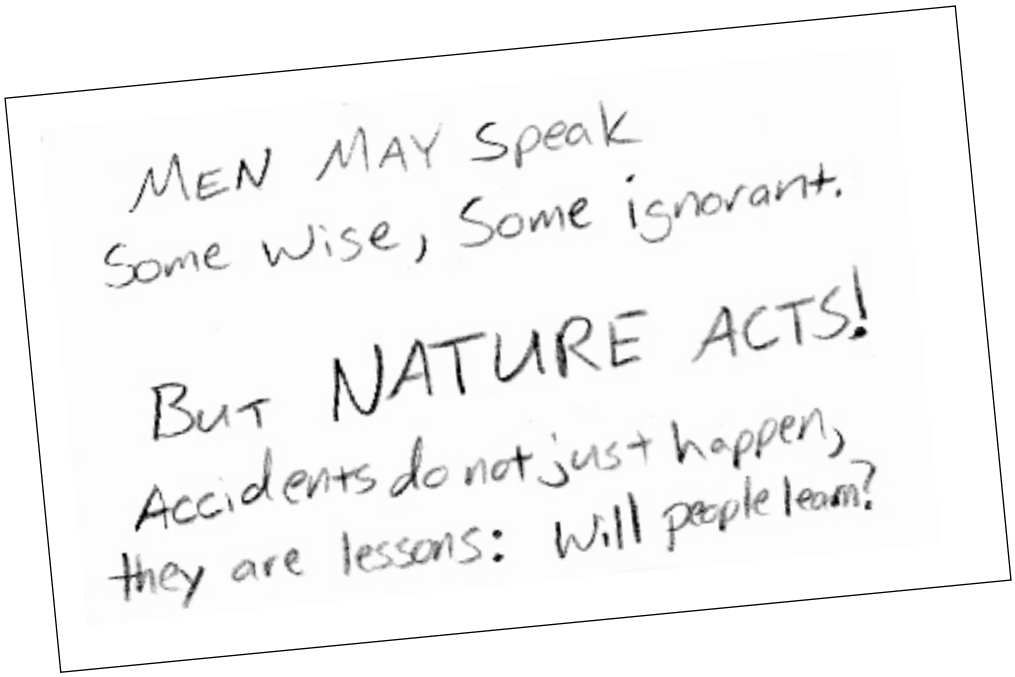
> What this exhibit made me realize is that we who respect nature need to become political and let our voices be heard. (1997)

> I also feel responsible in that I am a fuel consumer. I will now renew my efforts to conserve and reuse this material. (1998)

And even as *Darkened Waters* traveled over the years, Pratt Museum visitors continued to urge us to share the exhibition far and wide:

> This exhibit should travel through the lower 48 since too many rely on oil and don't have a clear understanding of their responsibility in the spill and their role in the future. (1999)

> I loved the Darkened Waters Exhibit. It was the most unbiased portrayal of the spill that I've seen—let the truth be known!! (2002)



The best way to make any exhibition live

What's to be learned from the *Darkened Waters* experience? Visitors' voices provided the driving force behind the project but also served as the most effective way to fairly address the raging controversy associated with everything related with the spill and response efforts. How to present so many divergent and conflicting perspectives? Let the people speak for themselves. At the same time, featuring the voices of commercial fishermen, oil industry workers, government officials, conservationists, Alaska Native people, and others caught up in the spill served to animate the exhibition as nothing else could have.

For those of us at the Pratt, it has proven that the best way to make any exhibition live is to pay close attention to our visitors and incorporate their insights wherever possible. This means more than adding a quotation here and there. It starts at the very inception of the project and involves visitors every step of the way, from planning to fabrication and updating. The Exxon Valdez oil spill taught many harsh lessons. But it also left the Pratt Museum and its visitors a kinder legacy in the form of a better framework for sharing our region's varied stories with each other and our many guests from other places.

MIKE O'MEARA is project coordinator at the Pratt Museum, Homer, Alaska. He was guest curator of *Darkened Waters*.

Adapted from an article that appeared in the *Journal of Museum Education* 28, no. 3 (Fall 2003). Reprinted with permission of the Museum Education Roundtable (www.mer-online.org).

Hundreds of Greens

Kitty Connolly

In 2005, the Huntington opened the exhibition *Plants Are Up to Something* at the Rose Hills Foundation Conservatory for Botanical Science. This is not just a traditional conservatory housing lovely displays of rare and tropical plants, but a front in the fight against "plant blindness"—the fact that, in general, people know very little about plants and commonly cease to notice them in daily life, despite their vital importance in the biosphere.[1]

Plants Are Up to Something contains more than 50 interactive exhibits, inviting visitors to engage with the collections through the practice of science, including a series of introductory exhibits that feature novel ways of looking at and thinking about plants. One of these exhibits is Hundreds of Greens—an invitation to look closely at leaves, drawing attention to subtle variations in a color that might be overlooked otherwise.

The exhibit itself is simple: We strung lengths of stiff wire between supports, with clips along the wire at roughly one-foot intervals. Small baskets attached to the supports contain grease pencils and 2½" x 4¼" laminated cards in various shades of green. The clips hold instructional labels (see right). The exhibit is surrounded by plants with a wide color variation. Visitors choose cards, write short notes on them, then clip the cards next to matching leaves.

This exhibit is a deliberate invitation to visitors to share their feelings and observations. Most of the conservatory exhibits are definitive (nectar from lavenders is always sweeter than nectar from lantana), so this open-ended, visitor-controlled exhibit adds extra depth to the interactivity of matching greens. It creates an opportunity for people to express their emotional reactions to plants and the place.

The exhibit seems to elicit waves of participation, spurred by example. Sometimes all the cards are used. Sometimes no cards are filled out for days at a time. If an adult leaves an evocative message, more adult-like messages will be left. If a child's handwriting shows up, many children will leave notes, or dictate them to their parents. When we erase the used cards, we always leave a few messages to "prime" the exhibit, or we even write out a sample or two to get things started.

The exhibit text reads:

Hundreds of greens
Move the cards to match them with nearby leaves.
Find your favorite green.
Write down a few words describing why you like it.

Notes range from poetic to incomprehensible. Messages are positive and about evenly balanced between plants, flowers, or the conservatory. Typical messages include:

- "Pretty green"
- "I like flowers. They smell very nice."
- "I ♥ this place."

A few comment on specific leaves: "They look like a shirt," accompanied by a drawing of the shirt-shaped leaf near where it was placed. Many include drawings of flowers, leaves, or simply scribbles. Some visitors take a poetic or evocative view, like "Fresh" or "Deep peaceful forest." One early message longed for a "green hammock made from the soft leaves." Another wished for a dress made from the leaves. Some are messages of good cheer, including messages of gratitude for nature's beauty. Authors sign about one-third of the messages. Most of the signatures appear to be those of children or young women.

The most surprising aspect of the exhibit is the number of cards that go missing. There are many more valuable and, I would think, attractive things lying around the conservatory, but it is the green cards that we have to restock on a regular basis. Perhaps people keep them as souvenirs, although they have no graphics or writing on them. Perhaps they just forget that they picked one up. I have encountered visitors carrying cards and pencils around the building. When asked about it, they say they are still considering what to write. This response makes me think that visitors take their contribution to the exhibit seriously.

Although visitors' use of the exhibit shows they are paying close attention to the collections, we think the exhibit could be better. In fact, we are currently reviewing all of the exhibits in the conservatory with the goal of improving interpretation. We will be revising the label to read:

Many shades of green
Move the cards to match them with
nearby leaves.
Write down a few words that describe
the color.

A change to the instructions may help to focus the comments and prove more effective against plant blindness.

KITTY CONNOLLY is botanical education manager at the Rose Hills Foundation Conservatory for Botanical Science, part of The Huntington Library, Art Collections, and Botanical Gardens in San Marino, California.

NOTE

1. The term, coined by biological educators James H. Wandersee and Elizabeth E. Schussler, is described in their 1999 article "Preventing Plant Blindness," *The American Biology Teacher* 61: 84–86.

Making the "Love Tapes"

Wendy Clarke

As a video artist, I have always been interested in using video as an interactive tool with myself and others. My mother, Shirley Clarke, gave me my first video equipment in 1972, and the first thing I did with it was to take a look at myself on the monitor and explore some possibilities provided by the immediate feedback. I started keeping a video diary and made entries in it for many years. I used the video diary as a tool for expressing my true feelings, needs, and wants, and to see if I was being honest. Most of the time the subject was about my current relationship and my feelings about love.

In 1977, I decided to try an experiment: I would talk to myself in my video diary for as long as it took to say everything I was feeling at the time, until I had nothing more to say. I bought some recycled videotape and cleared my schedule for the weekend. I set up my camera on a tripod next to the monitor, pressed the "record" button, and started what I thought would be a marathon with myself.

I made three successive 30-minute tapes (at that time, the tapes were reel-to-reel and 30 minutes long), watching each as I made it. Then I was all talked out. Up until this point, my diary was a place that was completely safe and private, but I had a feeling that there was something special about these tapes. I showed them to several people close to me, because I wanted to know if they were too personal to show to the public. I decided to show one of the 30-minute tapes, titled "Chapter One," in a small room off the main gallery of my exhibition, *Interactive Video*, at the University of Southern California in San Diego's Maderville Art Gallery. I included a guest book, and people wrote me long comments, telling me all about themselves and their experiences with love. This planted the seed.

"Love Tapes" began in 1977, when I showed "Chapter One" to a group of my mother's graduate video students at UCLA. After seeing my tape, five people sat by themselves in the TV studio, looking at themselves on a monitor. I put on a record from the school library—"I'm in the Mood for Love"—and each person spoke spontaneously about his or her own feelings about love. The record was three minutes long, so that was the length of each tape. We all looked at the tapes played back, one after the other, and, thus, the format for the "Love Tapes" was born. One woman talked about how love was the smell of her granddaughter's baby-powdered bottom. Another talked about how she has never found love and felt bad because she was "not sexy," and hoped that she would find love in college, but had not. The tapes were open, honest, and amazingly eloquent. When I returned home that evening, I was

I could imagine the possibility of getting every person on the planet to add his or her own particular experience.

elated—I could imagine the possibility of getting every person on the planet to add his or her own particular experience to the collection.

I started by seeking grants to make the tapes with as many people as possible from different backgrounds and cultures. I invited the participants to make tapes themselves, in which they sat alone in a room, facing their image on a monitor, and talking spontaneously about their personal feelings of love. After each made a tape, he or she looked back at it and decided whether to have it erased or to add it to the growing collection. As of 2006, about 2,500 people had added their unique contributions.

"Love Tapes" was first installed publicly at the Los Angeles Institute for Contemporary Art. For that installation, I showed my "Chapter One" tape to gallery visitors in a small private room and then invited them to add their own tape. About 100 people did. An older woman talked about how she had just fallen in love and it felt exactly the same as when she was 16. A young man said he did not want to feel love because it made his life too complicated. Another woman looked into the lens of the camera and talked as if she were talking to her lover, tearfully telling him how much she loved him. Each tape was unique: most people talked about romantic love and either the joy or pain of their experience.

After that exhibition, I retired my "Chapter One" tape and started to show the Los Angeles tapes to different groups of people. I made tapes with older African-American men and women from a variety of professions. The women talked about love as being the deep love of their woman friends. The women seemed to have ease about feeling

love. One sang at the end of her tape and looked at herself and said, "I'm trying to look a little better on the television than I really look . . . baggy eyes . . . I love myself too . . ." I had always thought about love as romantic love, and I realized how narrow that was. Making these tapes was expanding my own understandings about love, which was very freeing.

I made tapes with a group of Latin American students who had just come to America to study filmmaking. In these tapes, the participants talked about love of mother and nature and family. I made tapes with a group of older people who talked about love in a more global way, in terms of loving the planet and wanting to help people. Another group were prison inmates. They talked of family love, and the importance of telling people that you love them while you are with them. Each different group added more to the vastness of the subject, and I edited different selections to show others, which kept open the expansiveness of possibilities.

One of my favorite experiences was having a booth at the World Trade Center in 1980. The project began when KCET Public Television aired a 45-minute version of a selection of "Love Tapes" and, after the show, invited the audience to come to the World Trade Center to add their tapes to the collection. Three hundred fifty-seven people came and made a "Love Tape." All the local television stations and newspapers ran the story, and a red banner headline in the *New York Post* read, "NEW YORKERS LINE UP TO TELL THEIR LOVE SECRETS." Our booth was in the lobby of Tower Two, opposite the elevator that took people to the observation deck and restaurant. People who worked in the World Trade Center would visit on their lunch hours to see the tapes that had been made. Many made tapes of their own, and several made more than one tape.

An old West Indian man made four tapes, in which he sang songs that he had written about love. He was very dapper, with a suit and tie and bowler hat. Sometimes he had his dentures in, and at other times he was toothless. It was astounding how open and personal everyone was, even in this heart of the financial and business world. A young teenager made a tape in which he talked about how he had never known love—that he had been brought up in foster homes and acted out in school, even hitting a teacher with a chair. But his last foster parents said that they wanted to adopt him, and he wanted to stay—he had finally found love. Another young man with sunglasses and a punk look talked about his first love with a girl named "Barbie" who wanted to find a guy who was like a "Ken" doll. She threw him out of an apple tree and said she just wanted to be friends. A man who worked for a business on one of the upper floors looked into the lens of the camera and said, "I have been waiting for 31 years to say this to the whole world: I love you, I love you very much."

"I have been waiting for 31 years to say this to the whole world: I love you, I love you very much."

A physically disabled Japanese man made my favorite tape, in Japanese. He said he had just seen a documentary film about disabled people, and it made him remember

an experience in his childhood. He was walking in the country with his schoolmates and his teacher. He had to wear a corset, which covered his upper body, and one of the boys was making fun of him. The bully pushed him, and he fell over and landed like an upside-down turtle. His teacher picked him up, put him on her back, and carried him the rest of the way. He remembered resting his face on her soft back. That made his heart melt, and he thought about the bully who maybe was not such a bad person.

Watching the "Love Tapes" in the lobby of the World Trade Center, 1980.

I received many grants and made and exhibited the "Love Tapes" not only in the lobby of the World Trade Center, but also in a maximum security prison, a shelter for battered women, a van on the streets of Chicago, the Museum of Modern Art in New York, the Wadsworth Athenaeum in Hartford, and many other places. Eventually the project became too large for me to continue on my own, so in 1989, after I had the "Love Tapes" booth at the Exploratorium, I put the project to rest. Currently all 2,500 "Love Tapes" are in the Archives at UCLA, and I am patiently waiting for the project to reach its potential.

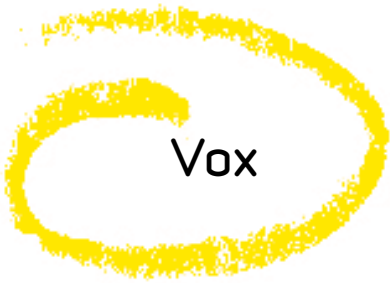
It has been my experience that it is critical to have people go through all stages of the process:

1. View "Love Tapes" made by others.
2. Choose your own music and background.
3. Sit alone in the room, facing your image on the monitor.
4. When the music starts playing, begin your tape. Talk spontaneously about your personal feelings and experiences with love for three minutes.
5. Watch your tape played back and decide whether or not you want to sign the release and add it to the growing collection.
6. See your "Love Tape" along with others who made a tape at the same session.

If people have the right to have their tape erased, they feel free to risk making a tape. If people do not watch their tape played back, they will walk away feeling isolation and shame. Going through the whole process is very cathartic and expansive.

I have noticed that people do not say what they are not ready to share, and that once having made their tape, they are ready to move on to a deeper level in their lives. In watching people share their tapes, I feel that they are expressing what is also deep in my heart, and as a result I feel more connected to the human experience.

WENDY CLARKE has explored video as a forum for personal expression not only through the "Love Tapes," but also as an artist-in-residence within the California prison system and through her video installation on HIV and AIDS, "Remembrance," which began as a commission by the Exploratorium.



Vox

Liz Keim

How does one design a safe place, in the midst of public activity, where strangers can reflect in personal ways on the nature of something as universal and open-ended as love? Why are people so willing to share publicly the intimate processes of their thinking and feelings? How can museums nurture curiosity and open participation in communal discourse and public sharing? What are the differences between our interactions with the external physical world and the internal psychological worlds we inhabit, and how do we express ourselves within each of these realms, both intellectually and emotionally?

These questions came into play when I encountered media artist Wendy Clarke's "Love Tapes" project, an interactive art installation set up at the Exploratorium in the autumn of 1989. In "Love Tapes," visitors were invited to make a three-minute videotape on the meaning of love. Visitors could step into a small private room out on the open expanse of the museum floor, select a backdrop and low music to best reflect their mood, and then speak freely on the nature of this complex emotion and human need. It was riveting to sit and watch the recorded sessions that people readily allowed to be saved and screened for public viewings. Longing, vulnerability, sadness, compassion, contentment, humor—these were some of the feelings that flitted through me as I reflected on the words and facial expressions of individuals who videotaped their stories. Not only did this diverse group of individuals—strangers to one another—find a reason to participate in the making of "Love Tapes"; they were also willing to make public and permanent the recordings of their fears, frailties, joys, confidences, and inadequacies. Unflattering in many respects, these portraits also capture a deep sincerity that is difficult to dismiss. In this willingness for strangers to share an articulation about a complex human emotion in a public way, Wendy Clarke created a larger narrative in which everyone—makers and viewers alike—can participate.

In some ways, "Love Tapes" was a hybrid between public performance and documentary filmmaking—two genres the Exploratorium has embraced since its founding. Early on, the Exploratorium built a 100-seat theater that offers a somewhat quiet space for temporal programs and activities like film screenings, performances, lectures, workshops, and community meetings. The intimacy of the room allows for dialogue and shared perspectives that are more difficult to come by on a daily basis on our dynamic open floor. The enclosed nature of the theater serves as a communal place where our visitors can gather together and have conversations about their experiences, whether in a question-and-answer session or by simply responding to the art works they have just experienced.

After starting the Media Arts Program in 1983, I worked with the idea of playing against visitor expectations by screening evocative, non-narrative short films that did not mirror the more traditional scientific documentaries, such as those shown on public television's NOVA. This was critical in creating a charged environment where the quest to question and understand one's relationship to the world is encouraged.

Mixing genres of animation, short documentary, visual narrative, and archival work into short, eclectic programs allows people to wander into the theater and experience another way of thinking about the processes in which natural and human-made systems work. The screenings are mediated to help build a collective understanding of how these works resonate with other kinds of investigations and activities that are taking place in the hands-on interactive arena. Our visitors range widely in age and come from all over the world with a variety of expectations.

By allowing the theater to remain open and quiet after a presentation, we provide the opportunity for conversation between strangers one to one.

Even though the film program is seemingly more meditative than other types of museum encounters, the act of seeing is more than a passive experience. Often the films have simple lyrical visual narratives, and viewers are invited to form their own stories from their own life experiences and encounters. Their personal memories and thinking processes become a part of the gestalt that leads to diverse commentary and questions after the screenings.

By allowing the theater to remain open and quiet after a presentation, we provide the opportunity for conversation between strangers one to one. Years ago, after a screening of *The Quiet One* (1948), the story of a young child abandoned by his family that has narration written by James Agee, I noticed that a few of the older members of the audience started turning toward each other, talking in low voices. During the course of this spontaneous conversation, they moved toward each other and formed a discussion group, recognizing that out of their singular experiences they were all touching upon and discussing some common emotion that had been elicited by a passage in the movie.

The theater, unlike the frenzied exhibit hall, can be a serene gathering place within which individuals share insights and stories and come to an even fuller understanding of what they have encountered. While watching a film in the dark, we are often swept along by overhearing laughter that spontaneously erupts. The nose blowing and subtle coughs that follow heartbreaking moments captured on celluloid clue us in that we not alone in our reactions.

It is important to think of this theater programming as a prototyping process, as a way of experimenting with what will or won't work in a family science museum setting, and to invite the audience to be a part of the conversation.

Early on, I invited media artist Andrej Zdravic to show a selection of his short non-narrative lyrical films. We didn't know how families would respond. When the lights

came up following the films, a frail elderly woman moved toward Andrej and, leaning on her cane, held her free hand to her chest and exclaimed, "Your films let me feel so much." Internal worlds were triggered by the nondidactic framework of the films, and unspoken connections were made between the audience, the artist, and the work at hand. These evocative experimental encounters are offered as another entry point of investigation into the workings of the world and what it is to be human.

Several years after the presentation of "Love Tapes," we helped Wendy Clarke set up a similar installation at the Exploratorium, called "Remembrance," for the exhibition *What About AIDS?* Because of the serious losses that so many communities have endured as a result of this disease, Clarke decided not to limit the length of time of the videotaping sessions. Our visitors were again invited into a private booth, this time to record memories of loved ones, describe the complexities of living with AIDS, and/or to reflect on the course of life and death. In an adjacent room, visitors could view previously recorded tapes. We found that this, and the other more personal artist installations, filled a deep emotional need in the face of what San Francisco and the larger Bay Area were experiencing in the midst of an epidemic.

Wendy Clarke instinctively understands how to create a safe space within which strangers can honestly share thoughts and feelings shaped by their own personal experiences and ways of seeing. Unlike the narcissism of "tell all" TV shows or Internet entertainment sites like MySpace and YouTube, Clarke's self-reflective exercises open up a way to allow most participants to strip away pretense without losing the essence of their personality and being—the source of wry wit, humility, wistfulness, wonder, the intellect, and a deep well-spring of emotional honesty. Hopefully there is a resonance between gained personal insights and the larger contexts of broader experiences that define community.

LIZ KEIM is director of film programs at the Exploratorium, San Francisco.

Inviting Visitor Voices into "SFMOMA Artcasts"

Peter Samis

For once, we listen—and our visitors speak.

The San Francisco Museum of Modern Art has used its podcasts as a platform to give visitors a public voice, both inside and outside the museum. By simply taking a microphone into our galleries, we bear witness to the myriad ways visitors make meaning from their encounters with the artworks on exhibit. Not surprisingly, these people are perceptive, in a sensitive and reflective mood, and well informed, even if their expertise is not art or its history. Their "Vox Pop" testimonials go where museums fear to tread, connecting specific artworks to very personal lived experiences—such as a Holocaust survivor in the midst of viewing an exhibition of works by German artist Anselm Kiefer, who addresses themes from the Nazi era.

Others, with no more history than the TV news, draw wrenching parallels to world events taking place far from the original time and space of the picture frame: For instance, several people spontaneously evoked New Orleans' devastation by Hurricane Katrina and the nightly news footage of carnage in Iraq when viewing the 100-year-old photographs in *1906 Earthquake: A Disaster in Pictures.*

While they are often more accessible, it is not just photographs—that stock-in-trade of our media-saturated culture—that evoke strong visitor responses. Painting and sculpture can, too. People come to museums to be stimulated, to think, and to feel.

Contemporary art gives us all an opportunity to process hitherto unseen sensations, to think new thoughts. And while it might take some time to articulate those thoughts clearly, and not everybody makes the cut in the final podcast, the process itself is worthwhile. For once, we listen—and our visitors speak. They have already begun to teach us, and we want to hear more.

PETER SAMIS is associate curator, interpretation, at the San Francisco Museum of Modern Art (www.sfmoma.org/artcasts).

Art on Call at the Walker Art Center

Robin Dowden

The Walker Art Center has been a leader in the adoption of new media as learning tools in art museums. One of these—a personalized alternative to the traditional audio tour—invites more active participation by visitors.

Art on Call (newmedia.walkerart.org/aoc) uses an industry standard Interactive Voice Response (IVR) system and the visitor's own cell phone to deliver up-to-the-minute information about current exhibitions, programs, and events; and artists' and curators' commentaries about selected artworks in the Walker's collection. Callers dialing 612/374-8200 any time day or night, inside or outside the Walker, are guided through the system. This information-on-demand approach allows visitors to choose when and where they access information—before, during, or after a visit. Because the data is processed using the standard MP3 format, Art on Call's interpretative material can be played online, downloaded as a prepackaged collection of MP3 files, or subscribed to as a podcast RSS feed.

Two features allow visitors to customize their experience and to share their thoughts with others:

- **Bread-crumbing:** Art on Call automatically keeps track of the artworks each visitor accesses, expanding the list every time she listens to a new segment. To retrieve this information, the user simply goes to the web site and enters her phone number.
- **TalkBack:** This note-to-self mode enables visitors to leave their own audio comments about the art for later retrieval. In order to build a collection of audience responses, Walker staff may select remarks to share with other visitors.

Art on Call not only allows for more personalized experiences, but also represents a small but significant shift in relations between visitor voices and expert perspectives.

ROBIN DOWDEN is director of new media initiatives at the Walker Art Center, Minneapolis, Minnesota.

Tossing a Pebble into a Pond: Nurturing Public Creativity

Douglas Worts

Art museums, by definition, are places of the muses—the ancient Greek goddesses whose role it was to inspire human creativity. With this legacy, why is it that so many people think of museums not as centers of creativity, but as quiet, boring, elitist shrines full of dusty objects behind glass? And how do we account for the phenomenon known as the "museum shuffle," in which visitors slowly cruise by hundreds of objects on display, rarely stopping for longer than a few seconds, speaking in whispers and keeping their hands to themselves?

Although museums have something unique to offer the public—through the collections amassed and the intellectual insights into the creativity of artists presented by staff, scholars, and consultants—few focus on fostering visitor creativity. But when they do, the results can be stunning.

The visitor side of creativity

To paraphrase Picasso (and many other artists for that matter), in producing an artwork, the artist carries the creative process *halfway*; it is the responsibility of the viewer to complete the process. This visitor-centered half of the creative process is based on the personalizing of symbolic objects. Museums cannot control how this occurs; they can, however, be supportive of visitors in the process of personalizing their experiences with works of art.

What does the visitor side of creativity look like? This creativity is idiosyncratic—sometimes tentative, sometimes dogmatic, at times intensely moving, at times shocking, at other times insightful. To this writer, visitor-based creativity provides a powerful complement to the intellectual insights of the museum experts. Accordingly, I submit that a core partnership—an honest and respectful relationship—needs to be fully developed between the public and museums (and particularly art museums), in which the many meanings of art can be explored and honored.

This article explores two initiatives at the Art Gallery of Ontario (AGO) that have attempted to foster and facilitate the creative spirit of visitors and could be the basis for such partnerships.

Share Your Reactions cards

In preparation for the reopening of the Canadian Wing of the AGO after a massive building expansion in 1993, the gallery redevelopment team hired three psychologists to help guide the development of new strategies that would nurture visitor "meaning-making." Representing the fields of environmental psychology, cognitive science, and creativity, the team utilized a range of interpretive devices, created a variety of engagement strategies, and employed unique approaches to room design through modulations of architectural scale, color, lighting, and surface treatments.

Among the most interesting of the engagement strategies were Share Your Reactions cards—7" x 10" cards with approximately 90 percent white space and an invitation to share a reaction. The addition of name, artwork(s) referred to, date, and a self-description of the visitor were are all optional. Because the cards are portable and do not invite specific responses, visitors are free to interact with the artworks in ways that encourage their own creative responses. Approximately 12,000 cards were used during the first nine months alone, and at least 5,000 of these were left in drop-off bins in the galleries. Selected cards were added to a display.

The cards have proven to be remarkable for their diversity of form and content. We are finding that contributions are not the kind of superficial judgments, such as "loved it" or "hated it," that often characterize comments books. Instead, the bulk of comments are personal and reflective. Many provide insight into how visitors are interacting with particular objects or groups of artworks. Often there is great sensitivity and intensity in the responses. A large number of visitors who use the cards choose to draw imagery of one kind or another. Some copy pictures on display. Others adapt images to their own creative ends. Still others create wholly new images, presumably inspired by their time in the gallery, or reflecting what is on their mind at the moment. Often, people seem to want to see themselves reflected, either literally or symbolically, in their imagery—and in their writing for that matter. This has been an important psychological phenomenon for AGO staff to become aware of: People want to see themselves reflected in their visits to museums. This has the potential to affect dramatically the way in which art displays are conceived and installed.

Following are some written and drawn public responses to experiences in the galleries, as reflected in the Share Your Reactions cards. This idiosyncratic material provides a glimpse into a powerful area of creative meaning-making that is part of the potential of every visitor.

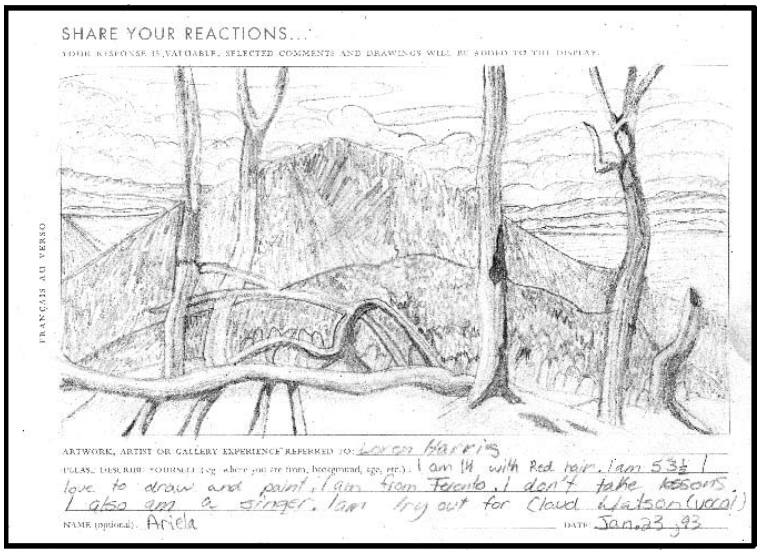


FIGURE 1

Figure 1 is a copy of Lawren Harris's *Above Lake Superior* by a 14-year-old girl. The fine detail suggests that the visitor has had a deeper than average level of experience with the painting, and the detailed description of herself suggests that she felt quite comfortable during this experience.

Figure 2 is an adaptation of a landscape by Arthur Lismer, *Sand Lake, Algoma*, in which the visitor has turned the original waves into "sad fish." This seems to be another clear instance in which the mood and identity of the visitor is projected into a reaction to the art—a sense that comes through strongly, despite not being drawn by a trained artist. I feel it is important that the institution understand that this kind of experience

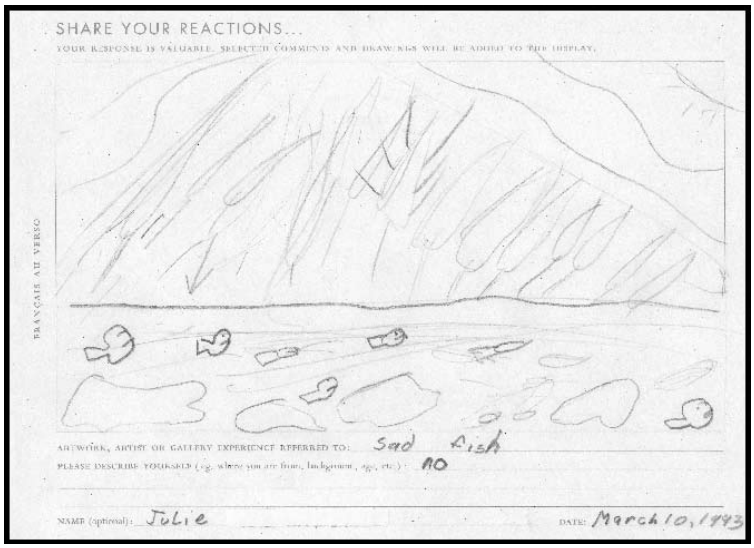


FIGURE 2

exists, has value, and warrants acknowledgment and respect by the Gallery. Trying to "teach" about the historical dimensions of the Group of Seven and their role in early 20th-century Canadian art would be largely pointless for visitors having this type of experience.

Figure 3 is a powerfully drawn image that bears no resemblance to any painting in the collection. Being in the gallery seems to have inspired not only the image, but also the emotionally charged text, which speaks of the Canadian landscape as the basis of the soul of the Canadian spirit.

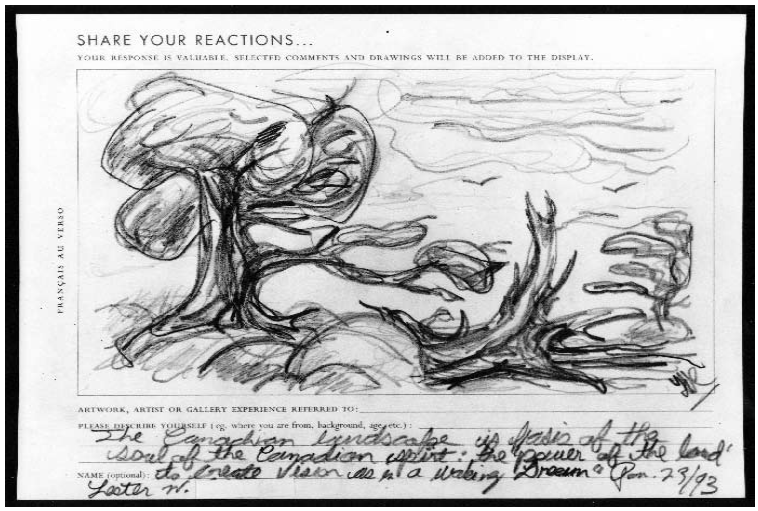


FIGURE 3

Figure 4 is a visitor's reflection on a highly stylized painting that depicts the town in which her grandmother was born. The experience has filled a gap in an important personal relationship.

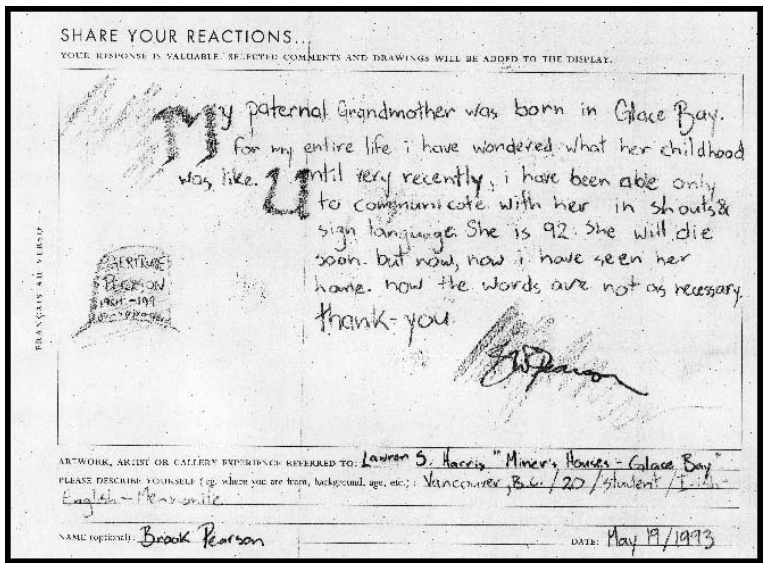
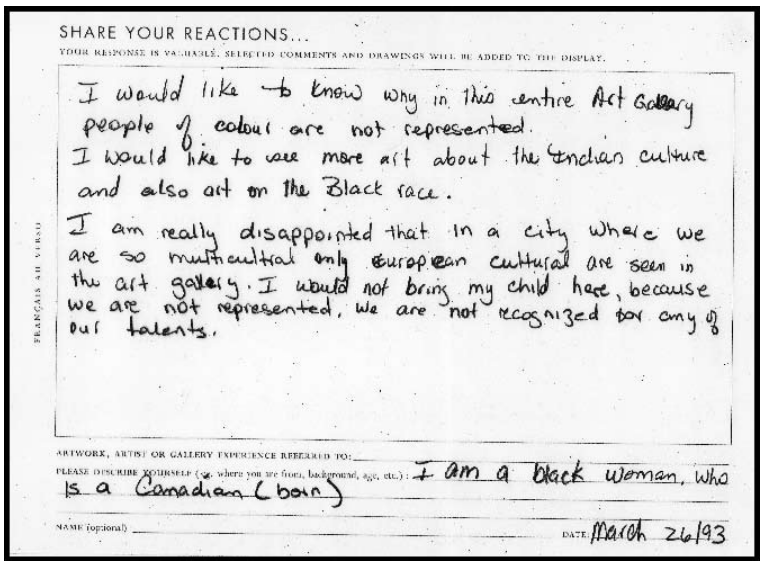


FIGURE 4

Forcefully raising the question of "racism" within the Gallery, one visitor asserts in Figure 5 that the institution needs to address this issue if it really wants to be an art gallery for the people of Ontario. She makes it clear that there is a problem, and that the solution must be negotiated between the public and the institution. This card, along with other forces, helped the AGO to develop a commitment to Aboriginal art and voice that had been excluded and ignored for almost a century.


SHARE YOUR REACTIONS...

YOUR RESPONSE IS VALUABLE. SELECTED COMMENTS AND DRAWINGS WILL BE ADDED TO THE DISPLAY.

I would like to know why in this entire Art Gallery people of colour are not represented.
I would like to see more art about the Indian culture and also art on the Black race.

I am really disapporinted that in a city where we are so multicultral only European cultural are seen in the art gallery. I would not bring my child here, because we are not represented, we are not recognized for any of our talents.

FRANÇAIS AU VERSO

ARTWORK, ARTIST OR GALLERY EXPERIENCE REFERRED TO:

PLEASE DESCRIBE YOURSELF (eg. where you are from, background, age, etc.): I am a black woman, who is a Canadian (born)

NAME (optional)

DATE March 26/93

FIGURE 5

And finally, one visitor wrote, in a card not reproduced here:

> The 'new' galleries are a tremendous improvement over the old. Coming here is now an engaging and intimate experience. One feels able to concentrate more clearly on works of art or particular periods without feeling overwhelmed or alienated. Coming here is now a joyous experience, whereas before it felt like a duty! Thank you.—I am an illustrator and painter, living in Toronto.

The range of responses is quite remarkable—and they display a kind of personal insight into the art experience that AGO staff alone could not articulate. For me, these images and comments need to be seen and acknowledged by gallery staff, so we can learn more about the felt power of the objects in our collections. But these reactions also deserve to be integrated into the interpretive strategy of the exhibits themselves and experienced empathically by other visitors. One possible outcome of such an integration is that other visitors may find greater comfort in entering the realm of personal meaning-making in a more conscious way.

Explore a Painting in Depth

One particularly exciting installation, called Explore a Painting in Depth, models different ways of engaging with an artwork—from examining relevant contextual information to consulting an expert to eliciting personal and idiosyncratic meanings with the aid of the imagination. This installation contains a single picture by J.E.H. MacDonald, entitled *The Beaver Dam* (Figure 6). The painting, which is typical of the Canadian landscape paintings in this area of the gallery, is of a wilderness setting with a still pond to the left and an arcing beaver dam with an empty canoe pulled up to the right of center. In the right foreground is rushing water, and just behind it lies a boulder. A dense forest pushes its way up to the edge of the rocky shore.

The painting is hung in a viewing facility that consists of a seating unit placed in front of a three-walled enclosure designed to minimize visual and auditory distractions. Using headsets, visitors can choose to listen to one of three audio programs while they focus their attention on the painting. One program carries the curator's insights into the artwork. A second provides dramatized comments about the artist, by his friends and family. The third is a 12-minute, reflective imaging exercise that encourages the viewer to relax and enter into a reverie with the painting. The first task is to establish a strong mental image of the painting. Then the viewer is invited to enter imaginatively into the space of the picture and to experience the sights, sounds, smells, and potential of being in the setting.

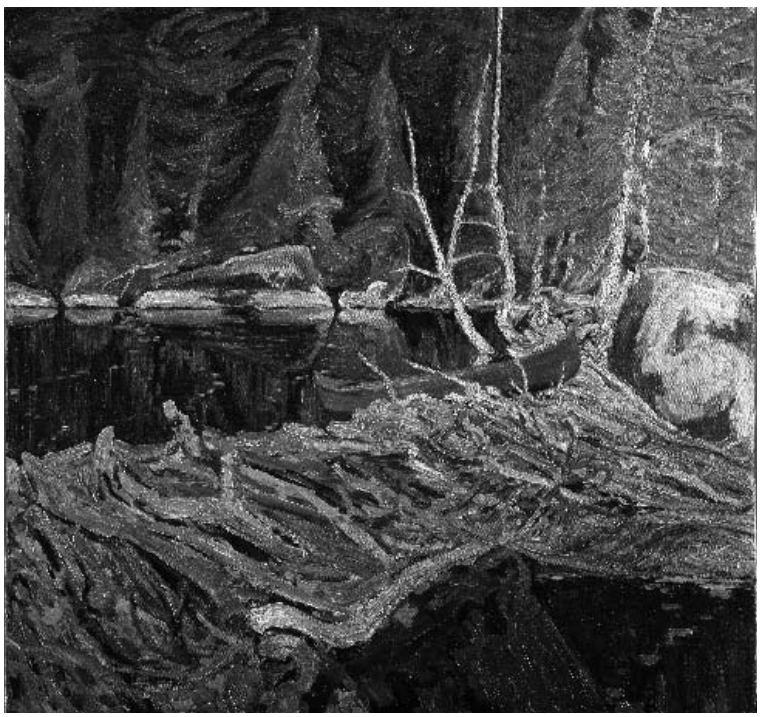


FIGURE 6
The Beaver Dam, 1919
J.E.H. MacDonald (1873–1932)
Collection: Art Gallery of Toronto
Gift of the Reuben and Kate
Leonard Canadian Fund, 1926

The response cards filled out in this facility have proven to be a rich resource that provides insights into the viewing process, the painting, and the visitors. The following illustrate the range of responses.

Some visitors use their imaginations to enter the world of the painting; experience the smells, sounds, and textures of nature; and create personal meanings for themselves.

> I enjoyed the sensual journey into the painting. Sight, smell, cool/cold autumn day was evoked. Clear air and water. Loneliness—the empty canoe vaguely depressing. The suggestion(s) of human form in the rocks and sticks of the dam add another dimension of questioning the artist's interpretation of the scene. Thank you for making me enter the world of the Canadian north! —I am 56 years old, WMF, from USA, some art training

Response cards . . . have proven to be a rich resource that provides insights into the viewing process, the painting, and the visitors.

Not everyone likes the imaginative approach to viewing artworks—or at least not the approach taken here. This visitor is expressing a desire for "content," as presented by the experts in the institution:

> I hate to be negative, because on the whole the new gallery is wonderful. But program #1, female voice, The Beaver Dam exploration is very silly. I was hoping to hear about art—and maybe the other selections cover this—but this heely-feely approach to art is just a bit much! Less new age, more content, please.

While a certain portion of our audience has difficulty with, and perhaps even feels threatened by, a nonanalytical approach, a significant number feel very good about making personal connections with artworks. Through the imagination, this visitor has both re-experienced aspects of a "near-death experience" he had had in a northern Ontario park, while reflecting on the natural cycles of life and death:

> Vivid colours and bold strokes bring out the relentless cycle of life, emphasizing destruction and at the same time, rebirth. The piece brought back a stream of memories relating back to a near-death experience I had while in Algonquin Park, along with the soothing sounds and smells associated with nature. I am 17 years old and am a student from Unionville High School. I am originally from Pakistan and have lived in Toronto for 7 years to date.

In Figure 7, a self-proclaimed "psychic artist" has interpreted the picture in what seems to be a very personal way. Most interesting, though, is the fact that all of the themes and images raised by this person recur frequently in the reflections of other visitors (such as the rock on the right, which has become a skull image).

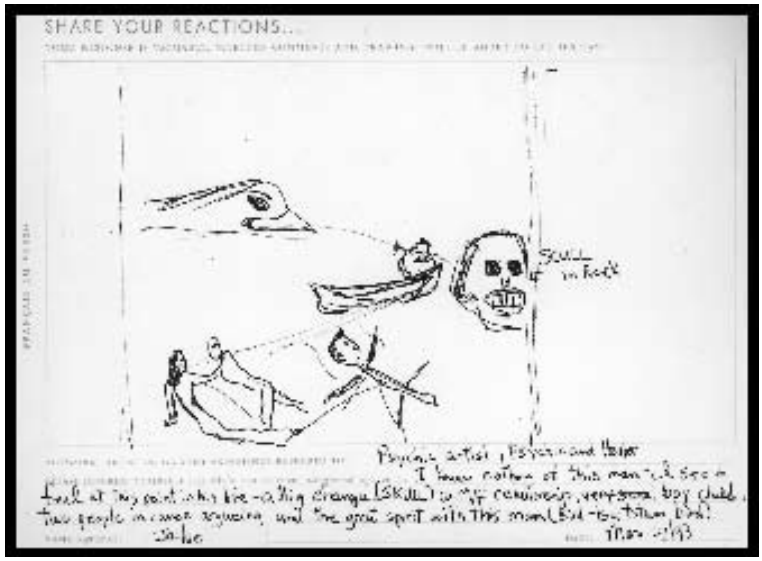


FIGURE 7

In Figure 8, a visitor who describes him/herself as "intellectual-type, creative" experienced a transformation of this painting, from an image that was enjoyable to one that is off-putting. The imagination led the viewer to see sinister images of death, to which s/he responded negatively. This strong reaction is intensely personal and testifies to the transformative power of the imagination.

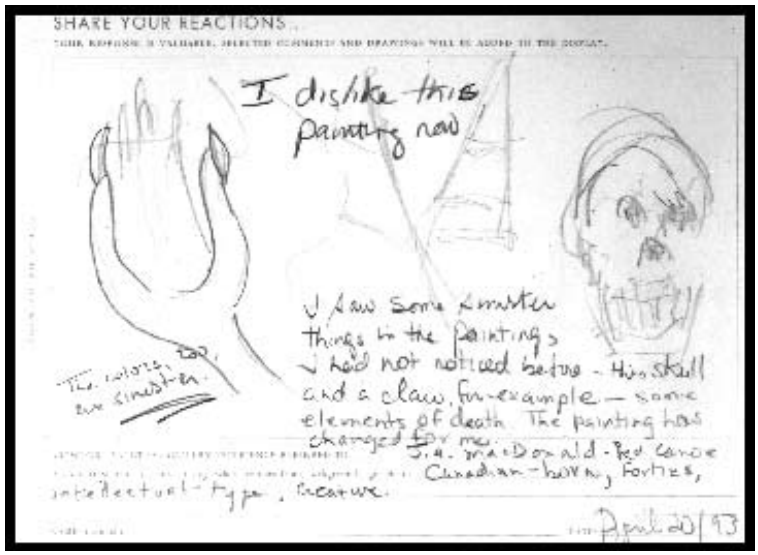


FIGURE 8

A variation on the death-imagery evoked by the painting is reflected in Figure 9 in a different interpretation of the rock on the right of the canvas. Here, the rock becomes a forest god, symbolizing nature as a holistic force—yes, it has death and decay as an aspect of life, but with a powerful and counterbalancing will to survive. This interpretation of the painting recurs frequently in many idiosyncratic forms.

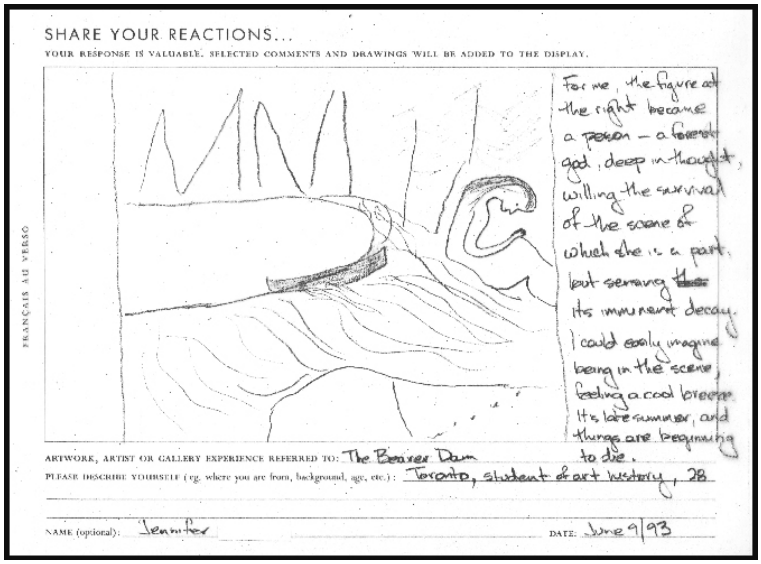


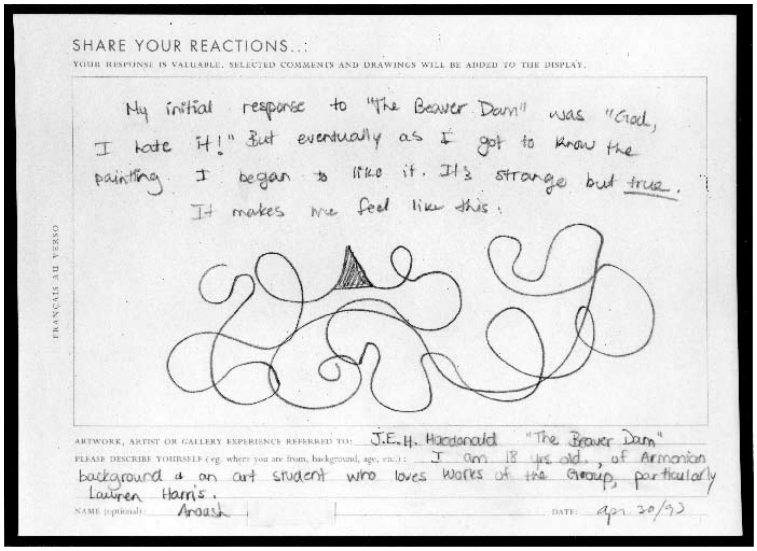
FIGURE 9

The visitor in Figure 10 entered into the world of the painting, took up an imagined vantage point, and drew the scene from the new perspective. She wrote of her experience:

I'm in the woods behind the rock, [I] climbed up and am looking down. Fresh. Wondrous.

FIGURE 10

Many visitors, like the one in Figure 11, began with the opinion that the painting was boring. Through the intense looking that is encouraged by the program, this person's judgment was transformed, and she ended the experience feeling buoyant and energized.


SHARE YOUR REACTIONS...:

YOUR RESPONSE IS VALUABLE. SELECTED COMMENTS AND DRAWINGS WILL BE ADDED TO THE DISPLAY.

My initial response to "The Beaver Dam" was "Crud, I hate it!" But eventually as I got to know the painting I began to like it. It's strange but true. It makes me feel like this:

FRANÇAIS AU VERSO

ARTWORK, ARTIST OR GALLERY EXPERIENCE REFERRED TO: J.E.H. MacDonald "The Beaver Dam"

PLEASE DESCRIBE YOURSELF (eg. where you are from, background, age, etc.): I am 18 yrs old, of Armenian background & an art student who loves works of the Group, particularly Lawren Harris.

NAME (optional): Anoush DATE: Apr. 30/92

FIGURE 11

Finally, one visitor's experience of *The Beaver Dam* (not pictured) led him to reflect about the importance of personal experience (as opposed to "patriotic harangues by groups and politicians") in developing a sense of identification with a homeland.

> How do we learn to love our land, our landscape, our country? Not by patriotic harangues by groups and politicians—but by living in it, watching and observing it, and then taking the time to reflect, ponder and integrate. Thank you AGO for giving me a few minutes of serenity and intense viewing—making me Look and Think! Making me love my land more than I know! I am a bartender in small town Ontario.

All of these cards demonstrate to me that the power and creativity of personal meaning-making is in the viewing of art. It is something that we in institutions have not actively encouraged before—in fact, museums have effectively undercut the public in this regard through their emphasis on objective judgments by staff "experts." Yet clearly the public can provide new insights into the artworks.

Ripples in the pond

Returning to Picasso's notion that half of the responsibility for generating creativity resides with the viewer, each of us then has a central and active role to play in our interactions with art. Most people will have no interest or inclination to play the roles of art experts or historians, but rather will encounter art with an innate capacity for creatively generating meaning through personal connections, thoughts, feelings, and insights.

This is the level at which the "success" of a museum must be measured—in the experiences of individual visitors. It may be that the true value of a museum is not in the amassing of prized objects, the building of ever-larger edifices to house collections, or the authoritative declaration of meanings. Instead, the value may reside in the simple nurturing of public creativity when individuals engage with symbolic material that touches them deeply or stimulates meaningful dialogue and debate. Such a road can be threatening to professionals and institutions that have long identified themselves with the power and authority to define meaning. To be sure, expert insights will always be important; they just won't be sufficient in relationship to a living and constantly evolving culture.

What is being suggested here is that placing an artwork on public display is like tossing a pebble into the pond. We can examine that pebble as much as we want, gaining insights into material composition and so on. But part of its magic is that when it is tossed into the pond, a parade of ripples rolls out across the pond, causing shifts, changes, and movement right across the entire body of water. Perhaps museums should be spending more time and energy understanding the impacts of tossing pebbles into the pond, and less on the practice of amassing and studying the stones.

DOUGLAS WORTS is an interpretive planner and audience researcher who works at the Art Gallery of Ontario, Toronto.

NOTE: Portions of this article were adapted from Douglas Worts, "Extending the Frame: Forging a New Relationship with the Public," in *Art in Museums: New Research in Museum Studies—An International Reader*, ed. Susan Pearce (London: Athlone Press, 1995).

In Your Face: The People's Portrait Project

Gillian McIntyre

In 2006, the Art Gallery of Ontario opened its doors to the public for a collaborative community project. Interpretive planner David Wistow and I had collaborated previously on two experimental interventions in the *Degas* (2003) and *Modigliani* (2004) exhibitions, where the public was invited to create art in the exhibition space. We used these prior experiences to design *In Your Face*, an exhibition created entirely by and for the public.

A call for submissions went out in January 2006 in newspapers, via e-mail, and on the AGO web site. Members of the public were asked to submit postcard-size drawn, painted, or written portraits. The only criteria were that the art be original and 4" x 6", and that a signed consent form accompany it. The portraits were not judged, and there was no limit on how many could be submitted.

The response was extraordinary. By the time the exhibition opened in July, people had sent over 10,000 portraits from across Canada and beyond in various media, including drawings, oil paintings, watercolors, encaustic, papier mâché, digitally based work, acrylic, silk screen, relief print, and photo-based imagery. Packages arrived containing portraits from individuals, whole communities, classes, and families. In an age when most mail is computer generated, these very personal handmade parcels were exciting to receive.

Many sent letters with their submissions:

> I'm thrilled about this show!
>
> I was wondering if you'll accept more than one piece from one artist and I was also wondering if the portraits must be self-portraits and I was also wondering if the portraits should be faces or if they can be entire bodies?
>
> Hooray for the AGO!

Bloggers also contributed:

> Doodle McDoodler on 2006-05-20 01:48
> Creativity and Imagination #4
> I think this project is seriously cool, and put an entry on my blog about it, as a way to engage with your public/customers. I haven't yet painted my self-portrait for the Art gallery of Ontario's In Your Face project, but I still can, and you can too. . . . This major gallery is taking a step out to engage their audience and demystify their subject: fine art. Even better, here are a couple of things that they have done: started a blog on their web site, part of which is devoted to

"Art is for everyone, art is in everyone!"

this project; set up a flickr photo blog for the project. I am impressed by these efforts to engage with the public and get innovative. They have moved a long way beyond putting some crayons and paper in the corner of the gallery for kids. . . .

Public imagination was captured. Through word of mouth, word continued to spread, and more submissions arrived not only from Canada, but also Italy, Germany, the United States, Great Britain, Japan, South Korea, Holland, Switzerland, France, and Australia. By December, we had received 17,000 portraits. The range of responses was vast—from all ages, levels of ability, and types of communities. The images reflected an enormous amount of effort and thought, and the humor, honesty, and ingenuity were moving.

All works meeting the criteria and submitted by December 1 were exhibited. Drawings were installed floor to ceiling in the Zacks Gallery—prime AGO exhibition space. During the course of the exhibition, visitors dropped into the space during gallery hours to create portraits to add to the collection. Visits, phone inquiries, and e-mails continued for months, and the exhibition's run was extended.

What has made this very straightforward public exhibition so successful? Perhaps one reason is that *In Your Face* tapped into the usually unrealized potential of museums as catalytic agents. Much of the creativity occurred off-site in communities in rural

Portraits were displayed floor to ceiling, to accommodate as many as possible.

Ontario, across Canada, and abroad. Group submissions from families, neighbors, schools, workplaces, lunch groups, and other community groups poured in.

A package of 23 portraits of various adults and children arrived with the following letter:

Dear Folk at the Art Gallery of Ontario,
Please accept the enclosed portraits for display in "In Your Face". We are members and friends of the Middle Road Community, an intentional community in rural Nelson, B.C. We had lots of fun working together to create these pictures. Thanks for your support of art and for sharing/spreading the word . . . art is for everyone, art is in everyone.

Several newspaper articles appeared in regional newspapers written by local people taking up the challenge themselves and calling for submissions for *In Your Face*. For example, Jen Piles, writing for Welland, Ontario's *Tribune* described *In Your Face* and challenged all to come and make portraits at a youth center on a specific Friday:

> A collaborative community effort like this will surely be celebrated, and there is no reason why everyone shouldn't take part. You can come out and use all the supplies available and create your own portrait. All the submissions created at the centre will be mailed in together at the end of February. It would be great to see the people of Welland, especially the youth, taking part in this creative collaboration. Let's take the art world by storm.

The call for portraits inspired communities—including Red Deer, Alberta and Brockville, Ontario—to hold mini-exhibitions before passing the works on to the AGO. There was a tremendous sense that individuals were contributing to and being part of a collective whole through their portraits. As one visitor to the gallery said: "It's depicting the soul of a society."

Many of the letters accompanying the portraits made it evident the importance of social inclusion in public galleries. The following letter is from a group in a Salvation Army home:

> I wish to thank you for this opportunity to show our face to the world! We are 8 men and women living in Toronto. Because we live with Development Disabilities the public often shies away from us. This exhibit will allow us to have our face in public as an equal, as one of the 10 billion who helps to create an amazing diverse world. Our portraits are pasted on top of a puzzle. This represents of our favourite past times. Dennis can complete a 1000 piece puzzle in hours. Brad, Karen and Thair enjoy bright, multicoloured puzzles. House 2 of Broadview Village is known as the puzzle house. Often puzzle work gives our bodies and minds a much-needed rejuvenated break from our loud day program settings.

"This exhibit will allow us to have our face in public as an equal, as one of the 10 billion who helps to create an amazing diverse world."

> Our portraits are also pasted on top of a puzzle to represent our unique situation of our continual lives' work. Guiding those supporting us to work towards finding the perfect matching pieces to create a unique being with unique tastes, interests, forums of communicating and desired respect. We are a continual masterpiece in progress and we thank you again for the opportunity to represent our community to the world. —Residents of House 2 Broadview Village

This letter arrived with one portrait, and over the course of the exhibition, this woman sent several more portraits:

> This is a self-portrait of a 52-year-old woman disabled by MS, arthritis and osteoporosis. It was a pleasure to embark on this mini project and prove that I am able to do something.

Literally hundreds of stories came in with the portraits:

> You put an ad in the Globe and Mail several months ago. I was so impressed with your mandate, I contacted my granddaughter Siobhan Isabella Hilsden in Ottawa to encourage her to submit a picture. If she would, I would! As she was named Isabella after my mother, I decided to do an impression of her namesake—Isabella (Ferguson) Selkirk, a nurse during the 1st World War. So three generations will be part of your exhibit. I wish you great success with your endeavours.

Another from a war veteran:

> Am struggling with a self-portrait as a P.O.W. Did the original in Stalag Luft 111 but reorganizing it to 6"x4" is not so easy at 90.

As the exhibition grew, it received significant media attention, not only to report on the project but also to use it as a location. This use of the gallery as a real community center brought life to the institution and transmitted the life of the gallery out into the community. On several occasions, television stations chose the exhibition as a backdrop for unrelated interviews. When Much Music from City TV interviewed Toronto rock star Emily Haines, the first 10 minutes of the interview surprisingly were about portraiture. CBC interviewed author Ryan Knighton, who was in town for the International Authors Festival. Knighton, who is blind, was positioned in front of a wall of faces. The Boys and Girls Clubs of Toronto chose to partner with the AGO and use the project, Boys and Girls Club Week, to raise awareness for their after-school, weekend, and summer programs. They held a media event in the exhibition during which the AGO's director, Matthew Teitelbaum, said: "I think the challenge with a big institution is it seems elitist. This project says, 'You belong here. This is your place.'"

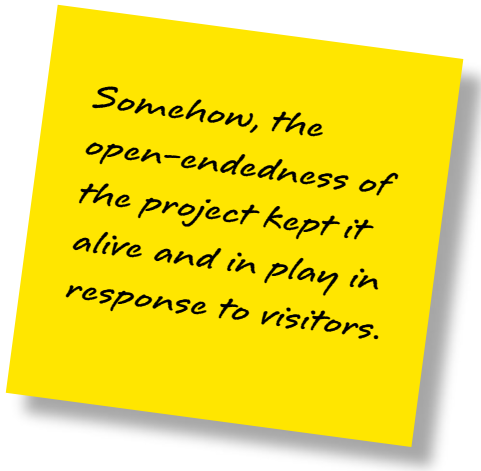
Visitors to the exhibition were able to make portraits at stations in the exhibition and leave them to be installed. Many photographed one another in the space, often holding up their portraits by those mounted on the wall. The exhibition was extensively used as a social space. One man sat at the drawing station for 45 minutes creating a drawing then came back for cards for his wife and co-workers. He said: "I think this exhibit is a great idea because it breaks into the social realm."

Internally, at the AGO, *In Your Face* gives cause for reflection at a time when the gallery is under construction and in transition. The transformation is not only physical, but conceptual as well, as we revisit our mandate and vision. In a sense, construction metaphorically removed the corsets from a fairly traditional institution and made room for change. As we, the gallery staff, sit in planning meetings, we blithely discuss the audiences as if we know who they are. This project allowed us to see the faces and hear the stories of some of the people and communities to whom the gallery really matters. At the outset, a couple of on-staff AGO naysayers referred to *In Your Face* as a "wallpaper" project and a "stocking stuffer" project, fearing that the resulting exhibition would be a "dumbing down."

What happens when an institution like the AGO relinquishes control? What if, instead of positioning ourselves as arbiters of taste, we challenge the gatekeepers who think they maintain the canons of excellence and provide an inclusive framework, honoring the creativity in all? That this exhibition was relevant was made obvious by the overwhelming response. It grew into something bigger than we had even imagined, drawing on the strength of the whole, doing together with the public what would have been impossible for us to do alone, and in the end, capturing public and institutional imagination. The strength came from the collective act of creativity and the community contributions. Perhaps we should grey the boundaries, and as Mark O'Neill, Head of Museums and Galleries in Glasgow, has said, "go beyond the sterile conflict between 'elitism' and 'dumbing down.'" Surely, fostering and honoring the creativity of the general public and thinking of their art as part of a continuum with professional art will be more fruitful.

As the exhibition evolved, we had to improvise to accommodate new work and respond to the many public inquiries, requiring the AGO to be more flexible than it is accustomed to being. Somehow, the open-endedness of the project kept it alive and in play in response

to visitors. The portraits noticeably reflected far more diversity of all sorts than is usually seen on AGO walls or among gallery visitors. Since Toronto is a very multicultural city, this deficiency must be addressed. On several occasions children in visiting school groups from West and East Indian communities enthusiastically pointed out people who looked like them on the walls, literally saying: "That looks like me" or "That's me with dreadlocks." Being able to identify oneself and having something to relate to is essential for inclusion. Museums have an implicit role in shaping identity and can start by honoring individualism.



Writing about the social purpose of and social inclusion in art museums, Mark O'Neill says:

> While many art museums now have education and even outreach staff, this represents essentially a welfare model of provision. A socially inclusive art museum would transcend this model and treat all visitors, existing and potential, with equal respect, and provide access appropriate to their background, level of education, ability, and life experience.[1]

Social inclusion means actively seeking out and removing barriers. Programming open-ended projects like *In Your Face* allows the institution to go a long way towards being relevant and inclusive. People enjoy being creative and want to explore the creativity of others in an accessible, attainable, and engaging way. If the museum can act as a catalyst for creativity—and 17,000 people have shown that it can—the only direction our standards can go is up. Let us allow the walls to become more permeable and see what will happen.

GILLIAN McINTYRE is coordinator of adult programs at the Art Gallery of Ontario, Toronto.

NOTE

1. In Richard Sandall, ed. *Museums, Society and Inequality* (London and New York: Routledge, 2002).

Collaborative Storytelling: Expecting the Unexpected

Jake Barton

In every tool we create, an idea is embedded. —NEIL POSTMAN

Collaborative storytelling, one of an array of visitor-input approaches we use at Local Projects, offers a radical inversion of a typical museum exhibit experience. In collaborative storytelling, visitors are not only the receivers, but also the creators of stories that move us and bind us together.

These projects are all about the unexpected. Visitors are asked to engage in an unexpected way by sharing personal experiences in a public forum. Designers need to create a system that draws out unanticipated stories. And if all goes well, the result is a diversity of stories that far exceed everyone's expectations.

Our projects always begin with a specific need. Our first, *Memory Maps*, created for the Smithsonian Institution's 2001 Folklife Festival, arose from the need to talk about New York City's culture with a voice as diverse, messy, and cacophonous as the city itself. For the two-week event, taxicabs, water towers, and bagel stores were installed on the Washington Mall, and more than 2 million people visited. In the midst of these large artifacts and signage, our small installation attempted to create something that wasn't just about New York, but in a very real way was New York—opinionated, passionate, and wild—in the form of stories by New Yorkers themselves about the city we share and love. We framed the interaction through a series of oversized maps of the boroughs and asked visitors to write stories on small squares of vellum and pin them to the maps.

The sheer number of responses surprised the organizers, who had to cull through and harvest stories as the system became overgrown and illegible. And the quality of the stories was amazing. My favorite: "Before this was Kennedy Airport, we used to hunt for rats out here with bows and arrows." Most unexpected was what I now call "triangulation." Strangers would see each other pinning their stories on the same neighborhood, sparking a conversation: "Wait! I went to Midwood, too, but you must have graduated 30 years after I did!" In this way the installation transcended its original purpose, and became a bit un–New York—a safe place where strangers could easily strike up conversations.

Listening to recorded stories at the StoryCorps' StoryBooth in New York City's Grand Central Station.

This first experience, born out of the unexpected, has led to our interaction design for StoryCorps, City of Memory, and other installations. As we embark on media design for the National September 11th Museum, we have a sense of some things to expect in the planning and execution of this most unexpected kind of exhibition:

- Expect an asymmetrical relationship between the large number of stories that you get and the very small number that are good for sharing.
- Expect that every detail of how people interact with your project will alter the quality and quantity of stories that result.
- Expect great stories—if the subject is something visitors care passionately about.
- Expect that it will be hard to get visitors to cross the threshold from receiving stories to creating them, without a person there to coax them.
- Expect that for most people the value of the experience will be in making and submitting a story, not in seeing it shared with everyone else.
- Expect to be surprised by the stories that you get—they will be better than any you anticipated.

JAKE BARTON is principal and founder of Local Projects, a New York-based design firm that creates media installations for museums and public spaces.

EPIGRAPH: Neil Postman, *Amusing Ourselves to Death: Public Discourse in the Age of Show Business* (Viking Penguin, 1985).

At the Smithsonian Institution's 2001 Folklife Festival, visitors could pin their stories to a large map of New York City.

Do Visitors *Question*?

Darcie Fohrman

In 2004, the Cantor Arts Center at Stanford University presented *Question*, an experimental exhibition and set of programs designed to challenge assumptions about art and its presentation in museums. It was intended to raise complex issues and present opportunities for the museum to experiment with the exhibition process, to engage in cross-disciplinary collaborations among staff and with outside consultants, to present its permanent collection in new ways, and to investigate how visitors learn in its galleries.

Tom Seligman, the museum's executive director, was in the midst of a yearlong endeavor to turn the museum's traditional exhibition development process inside out. On this project, he expected staff to:

- throw out their assumptions about the presentation and interpretation of art, in order to challenge themselves and engage visitors in new ways;
- distill a list of queries from the general public and university student visitors, and use them to create the exhibition;
- work in interdisciplinary teams—something they had not really done before.

I was hired to work with the Cantor staff to develop a new framework for collaboration to transform the *Question* concept into a visitor experience. I was asked to help staff focus ideas, consider new ways of presenting art, and design an installation that was true to the learning goals established for the project. I brought installation artist and interactive designer Michael Brown onto the project, and together with museum staff we attempted to transform the entire museum—inside and out—into a *Question*-related experience, and to bring new ideas for interactivity and visitor participation into the museum.

Because there was an expectation that the *Question* exhibition should be different than the other museum galleries or anything the Cantor Arts Center had ever done before, the process was difficult and, at times, contentious. Staff members were polarized. They disagreed about the intended audience, the nature of learning in museums, and whether an exhibition should emphasize objects or ideas. After an arduous and lengthy meeting, we finally agreed on what we would like visitors to think and feel after experiencing the exhibition:

- I am part of this place.
- My response to art is valid.
- I have learned new ways to appreciate art.

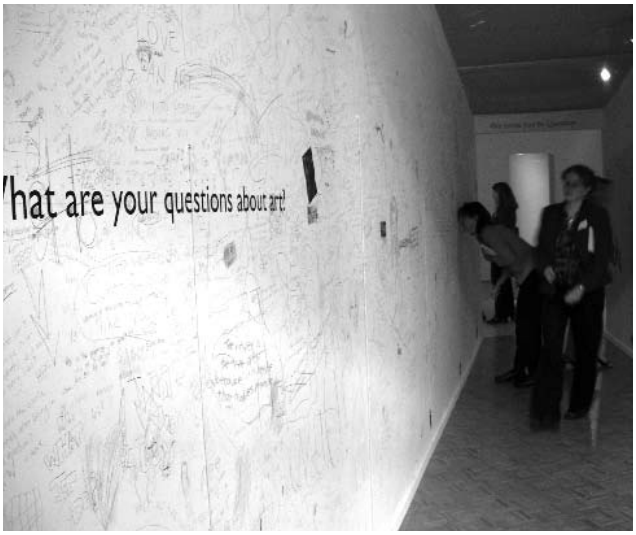
The Questions

Based on visitor surveys conducted before I joined the team, staff synthesized visitor responses into 20 questions that shaped the development of the exhibition:

- What constitutes an original?
- Is there such a thing as bad art?
- This looks like something a child could do. Why is it in an art museum?
- What is artistic quality?
- Why are these worn, broken, or imperfect objects in the museum's collection?
- Are sacred objects changed when shown in a museum setting?
- Can people understand art from cultures or periods other than their own?
- Is it art or is it craft?
- Who decides what is art and who is an artist?
- Why should I want to look at something that is disturbing?
- Have I looked at this piece long enough? Why should I give myself more time to look at it?
- Are ideas more important than physical objects?
- Where is the meaning in the work?
- What constitutes authenticity in a work of art?
- Why are these objects grouped in this way?
- Does the way we care for objects affect our understanding of them?
- How is the value of a work of art determined?
- Are these works shown as they were meant to be seen?
- How does art provoke an emotional response?
- What color should we paint this wall and why?

Some of the most basic questions, such as "What is artistic quality?," "Where is the meaning in the work?," and "Who decides what is art, and who is an artist?" were the most provocative for the staff and stimulated animated discussions.

Once the questions were identified, curators and other staff selected objects from the Cantor Arts Center's comprehensive collection of 26,000 works to illustrate the specific questions. We spent a lot of time listening to the curators' intentions and arguments, and agreed to try to create a design in which the presentation of the objects revealed the questions. For example, we created an interactive exhibit in which visitors could change the wall color surrounding a large framed painting. We chose not to state the question, "What color should we paint this wall and why?" Instead, we encouraged visitors to choose a color paint chip and insert it into a slot that projected the color onto the wall around the painting. By doing so, visitors could see that the color dramatically changed the appearance of the painting. Ultimately, each of the questions was given a space in the exhibition, with exhibits and artworks designed to actively engage visitors in exploration of the question.



Visitors could write their comments and draw images on gallery walls for others to see.

Magnet words captured visitors' emotional reactions to two works on paper.

Because of the visitor focus of the exhibition and an emphasis on the act of questioning, we incorporated a diversity of visitor-response elements into the design, including walls to write on, comment books, a wall of magnetic words on which visitors could construct their own phrases and expressions, sketch books, and a space where visitors could add their own definitions to a wall of quotes about art.

An entry tunnel deposited visitors into the middle of the gallery, creating some disorientation and forcing them to choose which way to go. Printed on a large white wall were the words "What are your questions about art?" Tethered pencils afforded the opportunity for visitors to respond. Some people drew graffiti, and many more people responded with comments like "What were abstract expressionists thinking?," "How can I get a job here?," "How many artists does it take to change a light bulb?," and "I have to think about it but thank you for letting me write on the wall."

The wall also contained small window-like holes that framed art objects in the gallery beyond. Some people responded to the framed views: "I would never have noticed that."

In a separate room there were prints on two of the walls and the other two walls were sheathed in metal. Reproductions of each work and evocative oversized magnetic words encouraged visitors to create phrases and poetry that revealed their emotional responses to the artworks.

Visitors could project their thoughts onto a wall filled with famous quotes about art.

One large wall in the exhibition contained famous quotes that defined art and described artists. Visitors could add their points of view to the wall by typing into a computer that projected their thoughts among the other quotes. Above the computer keyboard were the words "What is art? Who is an artist? You decide." The last 10 entries continued cycling on the wall when no one was making an entry.

Summative evaluation conducted by the museum's education staff and Johanna Jones of Randi Korn & Associates revealed that frequent art museum visitors were challenged and provoked in the installation, while visitors who were unaccustomed to visiting art museums were confused and wanted more information. Tracking and timing studies showed that visitors spent most time at the interactive and visitor-response exhibits—evidence that staff should provide more opportunities for visitors to engage interactively in exhibitions about art.

In the end, we created an installation that provided numerous ways for visitors to interact with the artworks, explore their own ideas about art and museums, and contribute their ideas and questions to the exhibition dialogue. And the exhibition raised even more questions than it answered, for staff as well as visitors.

DARCIE FOHRMAN is a member of the Museum Group. She consults with museums of all types to create multidisciplinary, interactive exhibitions.

Agents of Change: Co-Creating Exhibits

Julie Bowen

Over a period of six years, the Ontario Science Centre engaged in an initiative called "Agents of Change" (AoC), a transformational project that would ultimately affect more than a third of the exhibition space inside the science center and add an outdoor science plaza (all opened by fall of 2006). The intent of AoC was to develop experiences that encourage the attitudes, skills, and behaviors needed for innovation in an untapped market segment—youth and young adults (ages 14–24). At the outset, we knew that we could not accomplish this without transforming our approach to the development of exhibits. More kiosk-type exhibits with a single, predictable outcome (often the discovery of a science-based fact) would not get at the problem-solving, risk-taking, creative, collaborative skills we wanted to encourage.

Breaking down the internal, organizational barriers to the development of a new approach and new products could be the subject of a book in and of itself. The journey ultimately led us to conclude that co-creation with the audience we were trying to reach was the right choice for us. It was, indeed, the only way to achieve the outcomes we had set for ourselves.

For us, co-creating means that visitors have become participants in the process that results in new experiences and exhibits. Co-creation has taken many forms in an organic process of action, interaction, and response—a dialogue of participants, experiences, environment, and the science center, each shaping the other. The area of greatest engagement is an 8,000-square-foot "exhibition hall" called the Innovation Centre.

To find out how to engage our target audience in activities related to innovative skills and behaviors, we worked for three weeks with a group of 14- to 16-year-olds. The first activity in what was planned as a challenge-based workshop: Move a cup of water from one side of the room without the input of direct energy, using stuff from a pile of junk. Over the period of time we worked with these teens, they made it very clear to us that a hypothetical "challenge" was meaningless and that, while they may have been interested in activities like this, their friends wouldn't be. Root the challenge of moving water in a real-world problem, like getting crops watered in an underdeveloped country, and even suburban teens will engage.

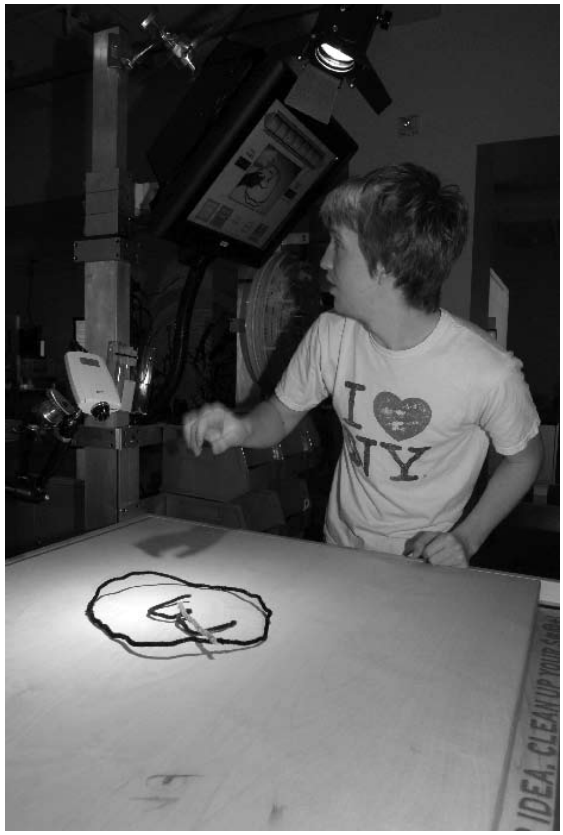
Some of the things we have learned from co-creating with our teen and young adult visitors can be summarized as a series of guiding principles:

- Invite youth into the process— engage them in your brainstorming activities, in your prototyping, and in your development processes.
- Co-creating is best done by being out on the floor with visitors, not behind the scenes in your workshop.

Provide opportunities for people to leave their creations behind to encourage others. Embrace subversion of the exhibit to the purposes of the audience.

- Test your ideas early with the audience you'd like to reach, before the ideas take on too much physical direction. Iterate quickly in response to their input, and try it again. Abandon things that aren't working or aren't engaging to the audience.
- Provide opportunities for people to leave their creations behind to encourage others.
- Embrace subversion of the exhibit to the purposes of the audience.
- Respect their perspectives—you are creating with them, not for them.
- Don't assume you know their language or their motivations—none of us are teenagers anymore, and the world has changed since we were. And treat them as adults—they see themselves that way.
- Provide opportunities for social interaction. Experiences should accommodate groups of young people traveling together, since this is what they tend to do.
- Remember where they live—online, in the moment, surrounded by music, in instant-messaging mode—and provide opportunities for them to share what they've done with friends and family who are not with them.
- Environment is important. A space that feels comfortable encourages people to try things they haven't done before.
- Go where your audience is. You can't expect them to come to you, so find places where they are already (e.g., youth advisory councils and school classrooms).
- Change your language—from "exhibits" to "experiences," from "developing for" to "developing with"—and your attitudes will change.

In one area of the Innovation Centre, people make shoes out of unusual and unexpected materials, with a goal of exploring the properties of materials in innovative ways. Once shoes are finished, visitors are invited to tag them and display them next to designer shoes and museum artifacts.



In the Ontario Science Centre's Stop-Motion animation experience, visitors can save their creation to a web site (www.RedShiftNow.ca), view it from home, and choose to post it for others to see and comment on. People come back time and again, even bringing their own materials, scripts, and established roles for their friends.

The scariest moment for many of us who worked on the project came with the realization that we were transferring ownership of the experiences from the science center staff to the people who use, shape, and change the Innovation Centre. The control was shifting from us to others—a natural conclusion to co-creating and co-developing. The surprises and delight we feel have become a new way for us to engage with our own work.

JULIE BOWEN is associate director, development and design, at the Ontario Science Centre, Toronto, Ontario, Canada.

RedShiftNow: An Online Agent of Change

Kevin von Appen

If Wikipedia says that redshift—"an observed increase in the wavelength and decrease in the frequency of electromagnetic radiation"—is evidence of an expanding universe, who am I to argue? Actually, I'm exactly the right person to argue, and so are you. That's because Wikipedia is a free online encyclopedia whose entries are grown, refined, and improved over time by a worldwide community of contributors. The users are in charge.

At the Ontario Science Centre, our RedShiftNow web site (www.RedShiftNow.ca) is following the same path, with tools and content increasingly driven by the questions, ideas, opinions, and creativity of our collaborators and visitors. Since its March 2005 launch, we've seen monthly visits grow to more than 80,000. Contributions from visitors and collaborators have ranged from a photo blog of surgery to fix a porcupine's broken leg (not for the faint of heart), to data on the number of stars visible in the night sky of Prince George, B.C. (1,000+), to a lively debate on how many of our visitors—on-site and online—would use marijuana for medicinal purposes (a solid majority, it turns out).

Fostering innovation

RedShiftNow's direction is rooted in the "Agents of Change" (AoC) initiative which, over several years, renewed more than a third of the science center's public spaces with a youth-focused, open-ended approach in which visitors become participants and co-creators.

How do AoC ideas play out at RedShiftNow? It begins with the choice to build the web site as an experiment, separate from the science center's main "corporate" site. Then there's the structure of the site—which has had hardly any structure at all, with new offerings jostling for space on a crowded, changing home page. This reflects RedShiftNow's prelaunch origins as the "OSC Garage," a site where pilot AoC projects found short-term online homes in 2003 and 2004.

The core idea is that our visitors will co-create the site, just as they are increasingly co-creating their physical experience at the science center. Given the small size of our web team—of its three members, only one is full-time on the site—that's also a survival strategy, since the same team develops and maintains our sprawling corporate site at OntarioScienceCentre.ca.

Highlighting current science

RedShiftNow's initial focus has been current science, driven by the 2005 launch of an on-site "hot zone" as part of "Agents of Change." A media platform developed by Australia-based PIVoD Technologies simultaneously streams content to RedShiftNow and to screens on the exhibit floor. Visitor feedback is displayed both online and on site. Vehicles for feedback include QuickPolls, which address questions like "Would you consider laser surgery to rid yourself of cellulite?", and SciencExchange, where visitors can debate topics like the ethics of manipulating animals genetically for human medical use.

RedShiftNow also includes blog-style Field Diaries from researchers around the world, like explorer David de Rothschild, dog-sledding to the North Pole to research

climate change (and encountering first-hand evidence in the form of thin ice) and kindergarten teacher Kim Saunders, sailing on a "floating classroom" in the Caribbean.

Our RedShift Report podcasts are driven by questions from listeners worldwide who subscribe through RSS. Weekly podcasts have tackled such subjects as what hairy guys can do to reduce the discomfort of static electricity, what's happening next with the International Space Station, and why radio transmissions from astronauts sound so dreadful. Getting listed on the iTunes download service—as far as we know, we were the first science center to appear there—helped drive downloads to 7,000 a month in less than a year.

We'll arrive at work each morning excited because we're not sure what our visitors will create that day on RedShiftNow.

Rounding out the content are daily science headlines selected by OSC staff to present in "hot spots" for on-site visitors and short news items (Science Briefs) that are also streamed to the science and tech news section of SympaticoMSN.ca, Canada's largest web portal. Finally, there's a link to our Café Scientifique initiative—part of a worldwide movement inviting people to engage with current science over a drink.

Reaching the tipping point

Does all this add up to an entirely new model for online science communication? A Web 2.0 site on the bleeding edge? Well, soliciting visitor input is certainly nothing new. Online citizen science projects, tracking bird counts or butterfly migrations, have been around for years. Many sites now provide RSS links to content of interest to regular users. And we're still examining ways to evolve SciencExchange from a "hit and run" bulletin board to a more sustained conversation.

But as we add more functions that allow visitors to upload, retrieve, view, and comment on each other's creations (one challenge: illustrate the emotion of fear using stop-motion animation and a pile of dried beans), and as we experiment with having visitors videocast our daily current science "hot spots," and as we expand our Citizen Science projects and Field Diaries to facilitate dialogue between visitors and researchers, we believe we'll reach a tipping point. Then we'll arrive at work each morning excited because we're not sure what our visitors will create that day on RedShiftNow.

How's that for an expanding universe?

KEVIN VON APPEN is associate director for daily experience operations at the Ontario Science Centre, Toronto, Ontario, Canada.

Adapted from an article that originally appeared in the July/August 2006 issue of *ASTC Dimensions.*

Exhibit Commons: Liberty Science Center's Open Source Experiment

Wayne LaBar

We're starting to shift from being passive consumers to active producers. And we're doing it for the love of it. —CHRIS ANDERSON

In 1999 the Liberty Science Center (LSC) began what it thought would be a five-year initiative to renovate and expand the museum to meet the needs of the public that came through its doors. As is wont to happen in major museum expansions, this effort took longer than expected. Meanwhile, a revolution taking place in the world of creative energies began to filter its way into the thinking of staff developing the exhibits. The result was an almost complete renovation of exhibits and experiences, but, more than that, an expanded and participatory relationship between the science center and the public.

With a project called Exhibit Commons at its center, this experiment invites and enables guests (our preferred term)—both those at the science center and those engaging long-distance through the Exhibit Commons web site—to study the operation and systems of certain exhibits and then suggest, develop, and submit new ones.

Context: new modes of participation

Developing the first new exhibitions since its opening in 1993 has offered LSC an opportunity to revisit how and what it presents through these experiences. As with any experiment, there are opportunities Liberty Science Center wishes to foster. These include: expanding the talent pool used to create exhibits by tapping into the general public's collective knowledge, ability, and imagination; expanding and deepening relationships with the science center's audience to include more artists and technologists and a wider range of cultural groups; and increasing the personal relevance of the exhibits at the science center by creating experiences directly from a visitor's point of view. There are two important corollaries of these philosophical underpinnings: one, a culture of experimentation and an entrepreneurial spirit, and two, a willingness to expand beyond the "safe" areas of science and technology.

Meanwhile, many powerful ideas from outside the museum and exhibit fields infiltrated our thinking:

- **Pervasive computing:** With billions of cell phone and Internet users worldwide, sophisticated computing power and technical ability are becoming the norm for many people, along with the idea that content can be accessed on demand at any time.

- **Customization:** Consumers can increasingly get exactly what they want—whether an individual song on iTunes or jeans made just for us via in-store body scanners—not just mass-produced items.
- **Hacking:** While not new, the idea, celebrated by media like *Make* magazine, has grown to incorporate the concept that hacking, in some arena, is something everyone can do. With so many people owning computers, digital hacking has taken off.
- **Participatory culture:** The Pew Internet & American Life Project reported in 2006 that "9 percent of the general public writes blogs, and 44 percent of U.S. Internet users have contributed their thoughts and their files to the online world." At the same time, people have collaborated in developing open source software like Linux, and Adult Fans of Lego ("AFOLs") participate in "cooperative building" projects.

Graffiti

Within this context, the idea for the Exhibit Commons started within one of LSC's major expansion exhibitions. In 7,000 square feet, *Communication* explores the innate human drive to communicate, the innovative ways people have developed to facilitate communication, and communication technology's social impacts. While wanting to examine some of the trends mentioned above, the team struggled to find an engaging activity that would encourage guest participation.

It was in this atmosphere that we decided to explore graffiti, and to allow visitors to try their hand at creating it. Thus was born the digital Graffiti Wall, where visitors use what look like spray paint cans to generate digital "paint" on wall-mounted projector screens. With a choice of colors and even stencils, the activity quickly proved popular in prototyping.

If real-world graffiti were digital, the team reflected, artists would probably "hack" the paint code, morph the paint or messages after the paint was "applied," or maybe "spray" symbols, pictures, or other digital images. Why not allow visitors to make these possibilities a reality? This led to a more fundamental question: What other experiences at the science center could be opened up to visitors? Suddenly, it seemed obvious that we needed to allow guests to exercise some of the "powers" they had been given in other areas of their lives and open up the exhibition floor at its most basic level. The Exhibit Commons was born.

Exhibit Commons

The Exhibit Commons is an initiative that gives visitors the opportunity to change, modify, add to, or, in other words, "hack" experiences found at the actual museum. It transforms exhibits into an "open source resource," where software and/or hardware is given to the visitor to change. In some sense it takes the exhibit development process and turns it on its head by moving the process from the few and giving it to the many. Early on, we opened a web site (www.exhibitcommons.org) to lay out the vision.

To begin turning the vision into reality at LSC, we designated a group of exhibits from the expansion and renovation project to be part of the Exhibit Commons. In an effort to open this experiment to everyone, these experiences cross over all expansion projects and involve both software and hardware. In addition to the Graffiti Wall, the initial suite of experiences includes the following:

- **Times Square of Science and Technology.** This multi-format art piece in the science center's central atrium focuses on current science and technology headlines. Displays populated by live data from the Internet will be widely distributed to allow the public to create their own art installations. College media and art students will be invited to participate.
- **The Narrators.** At this exhibit visitors can listen to conversations between individuals who hold divergent viewpoints about how to deal with the complex issues associated with the Hudson River and local ports, then contribute their own views.
- **On the Horizon.** At this exhibit visitors see photos of skyscraper construction sites from the local area and others provided by partner museums. Then they have the opportunity to record tall buildings going up in their own neighborhoods. These may then be added to the exhibit, allowing other guests to view them on the museum floor.
- **On Top of the World.** Using a modified 25¢ viewfinder commonly found on observation decks, this exhibit provides an opportunity to look at 360-degree views of skylines from around the world, which are stored and displayed in the viewfinder. Formatting is specified so users can supply views from other observation decks.
- **Language Karaoke.** In this exhibit based on the ubiquitous karaoke machine, visitors have the opportunity to try speaking a new language. The exhibit will initially offer four languages, but the format and suggested length of the video files will be supplied to the public so that other cultural groups whose languages are not represented can shoot and submit their own videos to expand the languages available.

Information about all of these exhibits, and how to submit material for review, can be found at the Exhibit Commons web site. At the time of this writing, the process we plan is to accept submissions through the web site, by e-mail, or perhaps in person, and then review them for relevance to the educational mission of the center and the exhibition in which the exhibit is located, along with accuracy of science and technology content. Once content is approved, the creator will be notified, and the visitor-generated experiences and/or content will be placed on the science center floor for a period of time. We also envision hosting competitions, offering classes for people to learn the tools needed for altering the experiences, and giving annual awards for the best work.

It seemed obvious that we needed to allow guests to exercise some of the "powers" they had been given in other areas of their lives.

Beyond this, we want the Exhibit Commons web site to serve as a single portal through which visitors can link to museums, science centers, and similar initiatives to find experiences they can change, add to, or modify. Through the blog, users will also have the opportunity to communicate, interact with each other, and move the idea forward. This reflects an important objective of the Exhibit Commons—to work toward creating a new and stronger community.

In the Liberty Science Center's new Communication gallery, shown here in an artist's rendering, the Language Karaoke exhibit invites the public to contribute their own recordings.

Unknowns

While our aspirations are clear, this experiment holds many unknowns that the science center will need to understand and learn from.

- While bringing guests' creations onto the science center floor certainly democratizes the exhibit process in some sense, museum guests have come to expect the "editorial" role of museum staff. Will these experiences be in conflict with such expectations? Will visitors "pay" to see other visitors' work?
- What criteria are used to determine whether a visitor's submittal through the Exhibit Commons is appropriate? In actuality, this places the science center in a more curatorial role, much like an art museum. Does this run counter to the "non-collection" approach espoused by many science centers?
- Visitors have developed a sense of trust in their museums and science centers, in terms of content and quality of experience. How will seeing a wider range of exhibits containing visitor-created elements impact this trust and the quality of the exhibit?
- Guests may, in fact, explore content and experiences tangentially related to the structure and organization of the exhibition more deeply if it is an Exhibit Commons experience that is on display. How will this affect the learning impacts the exhibits are attempting to achieve?
- How will donors and other museum supporters respond to exhibitions in which content and experience have, in part, been handed over to the public? What if an experience makes a statement about a lead donor?
- What relationship will staff have with exhibits generated by visitors? Is shared "ownership" of the experiences possible?

In the end, the Exhibit Commons will reveal much about how we as a field feel about handing over to the public some of the role we have played in developing exhibits. In the grand experiment of science centers, which is an attempt to have visitors interact with science and technology, perhaps the Exhibit Commons is an evolutionary step.

WAYNE LABAR is vice president, exhibitions and theaters, at the Liberty Science Center, Jersey City, New Jersey.

EPIGRAPH: Chris Anderson, *The Long Tail: Why the Future of Business Is Selling Less of More* (Hyperion, 2006).

Building *Nanoscape*

Erin Wilson

In the summer of 2006, the Exploratorium hosted *Nanoscape*, a visitor-built installation representing nanoscale structures. We focused on finding a way to engage visitors with the complexity of nanoscale science and deepen their engagement and commitment to the building process. At the same time, we wondered if knowing that visitors built *Nanoscape* would change its meaning or significance for other visitors.

The main focus of interpretation was on what we called "atomicity," or the idea that all matter is made of atoms. For this message, the scale of *Nanoscape* was important. The nanoscale is technically one-billionth of a meter—the scale at which atoms are revealed as the building blocks of all "stuff." (To give that size some meaning: A single human hair is 50,000 nanometers in diameter, and a molecule of DNA is 2.5 nanometers wide.)

Since the *Nanoscape* installation was oversized and immersive, visitors were able to walk through complex and orderly patterns of many "atoms" arranged in larger structures such as crystals or recently discovered carbon nanotubes. We thought that having visitors engulfed in *Nanoscape* would help them viscerally feel the multitude of atoms that it takes to build anything. Some visitors made a connection between *Nanoscape* and either atoms or molecules, and one visitor, referring to *Nanoscape*, said, "It's not complex—it's small things put together to look complex. It's like an atom because it has billions of things held together by electromagnetism and other forces."

Built by 2,400 visitors over three weekends, *Nanoscape* used over 640,000 ball-and-stick components (familiar from chemistry classes and double-helix models), fabric banners, custom-printed stickers, Lexan, a commissioned mural, quick ties, and plastic balls rescued from a local recycling facility. It took up 480 square feet and rose 30 feet into the air. Visitors could walk through the final installation while a giant diamond molecule hung above their heads, and walls of gold and platinum molecules lined their path. Walking through *Nanoscape*, one visitor said, "It's like walking through your own creation. It's like you are the artist."

We supported that feeling of investment and ownership by focusing visitors on the act of building and their role as creators. Visitors got "Official Nano Assembler" name badges and yellow hard hats; and to continue their

Visitors worked with volunteers and scientists to build an installation representing nanoscale structures.

We wondered if knowing that visitors built Nanoscape would change its meaning or significance for other visitors.

engagement after the visit, we created a web site where visitors could see photos documenting daily progress as new pieces were added by other visitors. The web site also offered behind-the-scenes photos, and, for visitors willing to sign in, we had a page listing all the "Official Nano Assemblers."

Volunteers were indispensable to the creation of *Nanoscape:* They helped facilitate the visitor experience, create the structures, and prepare for the construction. One volunteer created an "orientation table" that gave all the visitors an introduction to the practical aspects and scientific goals of the building process. Another volunteer drilled 14,000 holes in 7,000 plastic parts. For each of the six build days, we had between 15 and 30 volunteers working alongside the visitors, giving assistance and guidance.

Visiting nanoscale scientists were present during each of the building days. The scientists (after a short introduction to the basics of communicating with the public) spent the day alongside visitors, building, discussing their research, and answering questions. Some brought samples of nano-tubes and photos from their lab. We also had articles and a resource list for visitors who wanted to learn more.

Although visitors had access to the science, they came away from the build and the installation with less understanding of the science and purpose of *Nanoscape* than we had hoped for. Asked what ideas the experience had communicated to her, one visitor said, "It's like a building. Like a palace." But another visitor, asked what the activity was

Official Nanoscape Assembler William Dowell shows off his gold nanoparticle.

Assemblers working on carbon nanotube field-effect construction.

about, said, "It's trying to show a structure that's unseeable to our eyes normally." On an optimistic note, visitors who interacted directly with a staff person seemed to have a clearer understanding of the science and purpose behind the installation.

Asked by evaluators whether it made a difference to them that *Nanoscape* was built by visitors, people were, in general, appreciative. A typical response: "I like it better, knowing that. Just because anyone who comes could participate, and it makes people feel like they're a part of things."

As I reflect on the *Nanoscape* experience, I am excited to think about the further possibilities for the strategies we used. *Nanoscape* gave us a new set of tools and some practice using the tools, and now I want to test what we can do. How can we make the gap between the activities of scientists and visitors even smaller? How much labor are visitors interested in doing? What parts of the museum—of the content, of the physical objects—can be visitor-made? I want to try making it less staff and museum exhibits—and more "*our* exhibits," meaning the community of visitors and staff together.

ERIN WILSON is public programs manager at the Exploratorium, San Francisco.

Visitors Can Be Trusted

Liza Pryor

We often hear from museum people who have seen the Science Museum of Minnesota's Science Buzz site and want to do something similar at their own institutions. But a major hurdle they have to overcome is that many of them, on some level, don't trust their visitors.

I've heard from institutions that would love to allow commenting, tagging, or blogging on their sites, but assume that moderating all the posts would be an insurmountable challenge. I've heard fears that visitors will post content that's not valuable—either off-topic or unilluminating (e.g., "I love Blake" or "This exhibit sux") or flat-out wrong (e.g., "30,000 children die each year from complications from routine vaccination, so I'm not having my toddler immunized"). I've heard that curators, especially at history and art museums, worry about posting, and maybe legitimizing, the "uninformed opinions" of visitors.

But I've also talked to many developers who see the potential of social technologies and can see myriad applications. For those who *want* to give their visitors opportunities to comment, blog, or tag, here is some ammunition to help counter the nay-sayers.

- **Making content**—Hands-on museums and similar institutions try to provide lots of opportunities for visitors to make and do *stuff*. These new technologies let visitors make *content*, too.

- **Building on collective experience**—Social technologies build on experiences, so that my reaction to something becomes an integral part of someone else's experience, and so on. That's a cool thing, especially when you're talking about, say, tagging all the possible connections among 100 Minnesota icons, or people's reactions to the *Body Worlds* exhibition, or recollections of natural disasters that schoolkids have lived through.

- **Staying current**—Social technologies let us create exhibits *fast*, and change them easily as new information becomes available. For example, we could update our posts about peregrine falcon chicks hatching in a nest box at the power plant just outside the museum's windows as often as we needed to, which was quite often when the chicks were hatching and fledging. And we could link to the sad, soap opera story of the same nest box the previous year.

- **Connecting with research**—If a visitor responds to a post with a question that I can't answer, I can write back with my theory and some links to further information, and promise that I will e-mail an expert. When I get an answer

from a scientist, I can use his or her real words, and link to other resources associated with that expert. Even better, some scientists respond themselves. If I get a different answer from another expert the next day, I can show that tension and we can talk about why the answers aren't the same.

- **Customizing**—It's all completely custom, tailored exactly to what that visitor was asking. If one of our goals is to get visitors thinking critically about the science they hear, read, or see, and to figure out how to get information, I think seeing how that's done is important.
- **Recording**—Finally, as my colleague Keith Braafladt has pointed out, all of these online tools "deposit artifacts of our learning out in the community"; these artifacts persist, and we can return to them long after our initial experience.

Visitors *can* be trusted, and social networking opportunities *are* valuable.

LIZA PRYOR is a senior exhibit developer at the Science Museum of Minnesota, St. Paul.

During a September 2006 discussion in ASTC Connect, Bryan Kennedy and Liza Pryor talked with colleagues about Science Buzz and the "radical trust" that lies behind it. These thoughts are drawn from chat records.

Writing to Learn in Museums

Bill Watson

People need time to think about their thinking—to step back from activity and consider it from multiple perspectives in light of what they already know.

On a walk through a museum on a busy weekend afternoon, you might pass friends looking together at a sculpture, or calling each other to come see the actual bed slept in by one of the presidents. You might see a father helping his daughter hoist herself up in a chair attached to a giant pulley system. Maybe you hear a mother and her son exchanging ideas about how to construct a building that won't crumble on a shake table or witness two college students on a date flirting with each other as they hear the electric signals of their heartbeats on a drum. The ways in which people voice and share their unique ideas, memories, perspectives, and experiences in a museum, through their words and actions, are as varied as the visitors themselves. In a visit to a museum, visitor interactions with each other help them to both learn exhibition content and start to understand the world from new perspectives.[1,2]

For novices of any age, simply providing a "Wow!" experience might be a sufficient educational outcome for a museum visit. However, as people learn more about the things that interest them (e.g., art, history, science), it becomes important for them not only to know the facts, but also to be able to understand and use the tools of the discipline to contribute to their own and others' interpretations of the world.[3] And for meaningful learning to occur, people need time to think about their thinking—to step back from activity and consider it from multiple perspectives in light of what they already know.[4] Visitors do engage in this kind of reflection upon their experiences after a museum visit.[5] But it seems important to devise ways for people to reflect *during* the visit in order to maximize their experience and facilitate their meaning-making process.

Writing might be one way to encourage reflection in museums. However, with so much stimulation competing for visitors' attention—including other exhibits, friends or family members, and perhaps a limited timeframe—it might seem unlikely that they would have much time to stop and write anything down. Further, writing might be perceived as the domain of formal education, with efforts to include it in an exhibit experience as perhaps going too far toward "formalizing" the informal experience. However, authors in this volume have described writing strategies incorporated into informal learning experiences that allow visitor voices to be heard in new ways. Because there are some roots for writing-to-learn in informal environments, and because writing can be so valuable to learning, it seems that it warrants some exploration of *why* it might be valuable for helping visitors to find and share their voice—or identity—in a nonschool environment and *how* that might be accomplished.

Writing as a tool of learning

Writing is effective as a learning tool because it requires both articulation and communication.[6] It demands the organization of knowledge, which requires reflection on what is to be written.[7] That is, in order to write down an idea, a person has first to realize that he or she has one and then figure out what it is. That kind of metacognition, or "thinking about thinking," is an important step toward gaining expertise.[8] Further, writing down an idea is both a mental and physical act. Because it requires the coordination and focus of the hand, the eyes, and the brain, it becomes a highly engaging and personal task, very much like the process of meaning-making that individuals experience in museums.[9]

The relationship among the hand, eyes, and brain is personal in a fundamental way: The brain is highly active when the eye sees the hand transcribing what the mind is thinking. Research on brain function suggests that when a person interacts with the environment, the neurons (or individual cells) in the brain are activated in a specific way unique to that interaction.[10] However, the brain doesn't store the memory of an interaction in one place so we can go and "get" it when we want to remember it. Instead, the brain stores a record of the neural activity that takes place during interactions. For example, when a person sees a red ball, the brain activity that recognizes—and eventually stores—information about the color of the ball takes place in a different part of the brain than the activity that recognizes its shape. The brain makes connections between the color-sensing neurons and the shape-sensing neurons so that when that person remembers the red ball, those same neurons and the connections among them are activated again.

If the person seeing the red ball has the chance to hold the red ball, the set of neurons that sense the body's physical relationship in space to other objects becomes active. That area of the brain is then connected to the areas of the brain that sense color and shape. This is one reason why *interacting* with exhibits provides a more memorable experience than just seeing them. It might also help to explain how writing can help ideas to become more cemented in our minds and in our memories. When the verbal symbols of language—words and sentence structures—become interwoven with information from the five senses, the connections the brain makes are that much more complex. Taking the time to write down the words and sentences associated with an idea forms new connections between the shape of the letters on the page (sight input), the physical act of writing them (orientation in space), and the ideas they represent (existing connections among neurons).

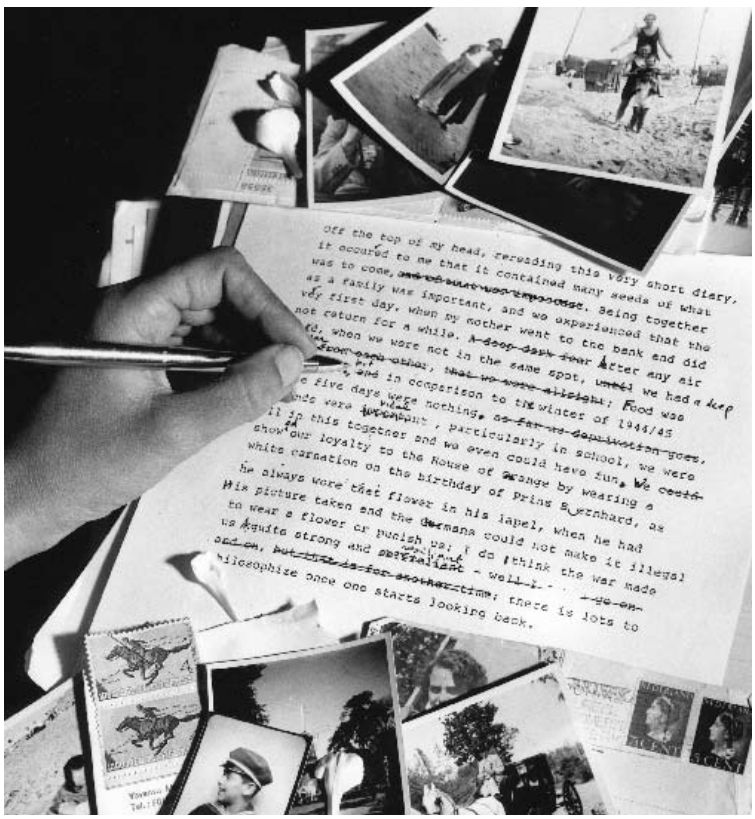
> Once something is written down, it can be corroborated or challenged, either verbally or in writing, by someone else.

Of course, even though this is a highly personal process, a main feature of writing is communicating the results of that process to others. Writing might be considered a conversation without a conversation partner: An expert writer is able not only to express

his or her ideas, but also to anticipate what another person might say and respond to those alternative views.[11] The hope is that others might eventually read what has been written and engage in a meaning-making process of their own.

As an act of communication, then, writing goes beyond the articulation of an idea. The permanence of the written word affords it some authority and provides a reference point for further development of understanding.[12] Once something is written down, it can be corroborated or challenged, either verbally or in writing, by someone else. The writing process among scientists is an essential component of the social construction of new knowledge. For example, two or more scientists usually contribute to writing an article about an experiment, negotiating meaning before submitting it for publication. After it is submitted, it is responded to—in writing—by several other scientists. The responses are incorporated into a new version that expresses the knowledge collectively constructed by multiple representatives of the science community.

It seems clear that writing can contribute much to the negotiation of meaning and construction of knowledge—hallmarks of science, art, and the humanities, and of meaning-making in informal settings. If the mission of a museum is to convey not only what we know about something, but also *how* we know it, shying away from a tool as valuable as writing does visitors a disservice.



Connecting voices across time and space

Can writing sufficiently overcome its ties to formal education to be a comfortable—and even enjoyable—experience for visitors to museums? There are multiple examples in this volume that suggest that it already has. The use of the "talk-back" since the early 1970s in places like the Boston Children's Museum and the Brooklyn Children's Museum has allowed visitors to respond to an exhibition in writing and post the response for others to see. From a knowledge-construction perspective, an intricate system of comments and responses can be developed, extending a conversation that might have existed between just two visitors to include the voices of other visitors, past and present. Visitors can incorporate other visitors' comments into their own meaning-making process. More voices means greater potential connection—and meaning-making—for future visitors.

Although the tactile nature of writing with a pen or pencil on paper and the physical posting of a comment on a wall no doubt contribute to the connections made within the brain and therefore to the personal meaningfulness of talk-backs, computers and the Internet can extend the conversation to even more visitors across more time and into new spaces. The advent of "Web 2.0" technologies, which allow people to contribute to a body of knowledge electronically through the Internet, has extended writing to learn beyond museums and into any informal setting (i.e., a place that isn't a school). For example, the Science Museum of Minnesota's Science Buzz and the Ontario Science Centre's RedShiftNow web sites offer visitors opportunities to contribute content and talk with other visitors and scientists about science questions and ideas. People who have never visited a science museum might be able to contribute to the knowledge construction within its walls by communicating about data online, in writing, with those who have been there.

These examples suggest that writing to learn can be as important to learning in informal environments as it is to learning in formal environments. There is time for reflection during and after experiences with exhibitions at museums. When that reflection is done in writing, the opportunities for learning expand not only through the act of writing, but also through the collaboration that recording ideas and reflections affords. Each group at a busy exhibition—the father helping his daughter, the mother and son working together, the young group of friends, or the couple on a date—builds meaning together through shared experiences. Research on learning suggests that the meaning they build can be enhanced through individual and collective reflection—and contribute to the meaning-making of others—inside the museum and beyond.

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Messages in Bottles

Richard Toon

When visitors to museum exhibitions write in comment books, they are also sending messages in bottles. They don't know who might receive them, and they don't know the effect on the unknown reader, but they do hope and expect that they will arrive somewhere and be read by someone. As researcher and evaluator at the Arizona Science Center (ASC) until a few years ago, it was my job to read these messages. What follows is the story of three exhibitions—the different forms that requests for comments took in each, and the differences in response this produced.

Scribbles and scraps

The first set of comments was collected in a permanent gallery called *All About You* that housed exhibits on psychology and the human body. The psychology exhibits, developed by the American Psychological Association and the Ontario Science Centre, had toured nationally for six years or so before becoming a permanent part of ASC when it opened in 1997. One of the exhibits invited visitors to write down their reactions to the psychology exhibits and slip these comments into a small box. The gallery staff dutifully collected the contents every few days, but although they began to pile up, they were never analyzed.

I decided to take a look at two years' worth of collected material, which amounted to several thousand scraps of paper. After many hours of wading through a huge cardboard box, I found virtually nothing to analyze. Most were pencil scribbles on scraps of paper, rarely containing words. From the handwriting of those that did write, it was clear that almost all were from children, and two phrases were used more than any other: "It's cool" and "It sucks." From a sampling of a few hundred I ascertained that "It's cool" was written almost three times as often as "It sucks." It struck me that the quality of the comments might have been related to the quality of the materials supplied. Staff of the Exhibits Department provided the exhibit daily with large amounts of blank recycled scrap paper that they tore into small sheets about 3" by 4" plus handfuls of stubby golf pencils.

Given the poor response, I experimented with better paper, better (larger) pencils, and various printed statements on the comment sheets, such as, "Please tell us what you made of the psychology exhibits." The result was that more adults (again judging by the handwriting) wrote longer thoughts, and the scribbling was greatly reduced. Comments were mostly from teachers, saying they generally appreciated their visit to the center and thanked the center on behalf of their school, which they usually named.

The quality of the invitation did affect the quality of the response.

They rarely mentioned psychology. Children also contributed "It's cool" and "It sucks" at the same ratio, but at a reduced rate.

One can speculate why this approach never produced rich results. One possibility is that the exhibition featured diverse sub-fields in psychology, and visitors may not have gained an overall sense that was easy to summarize. It may have been the exhibition's location in a set of exhibits, many of which involved self-testing devices, which may have confused visitors about its purpose. The only firm conclusion I did draw was that the quality of the invitation did affect the quality of the response. This was borne out even more when in 1999 ASC hosted the exhibition *What About AIDS?*

Confessions, memories, reflections

What About AIDS? was developed by the National AIDS Exhibition Consortium (a group of science centers) and the Centers for Disease Control and Prevention. It included a "wall" of letters and notes about AIDS and asked visitors to add their comments and place them in a box. The box was similar to the one in the psychology exhibition, but the quality of the materials was much higher. I have written elsewhere of how this exhibit produced comments of deep personal reflection and engagement[1], which a few examples may illustrate:

> I've never been close to anyone with AIDS. I do not know how I would react if I did. I'm scared to be around an AIDS inflicted person and I know that's stupid, because you can't catch AIDS by talking. Physically I know this, mentally I'm scared. More education is what people like myself need.

> I am an infected woman. I got this disease in 1993 from unprotected sex. My life has been changed forever. People should be very concerned as this virus will only continue to spread. We are on the verge of a major health care crisis and people need to wake up. The exhibits are a great way to educate everyone.

> I learned that you can die of AIDS and nobody will want to play with you or even they probably won't want to be your friend. Janin, 9.

> I wish we, as a society, could erase the stigma associated with HIV and AIDS. In 1990 my father died of the complications of AIDS. It was not until after I saw the death certificate that I found out he actually had AIDS. He had told us he had cancer. When we asked those who knew, they said he was afraid we would stop seeing him or not let him see his grandchildren. Nothing could have been further from the truth. I loved my father dearly. He died without sharing his illness with me. I will never have closure on this matter, because I never realized how long we actually had with him left.

Visitors variously used the comments box as an opportunity to confess their fears, to memorialize and remember loved ones, to express reflections on the AIDS issue, and so on. Some found a new understanding, some expressed their struggle with the issues the exhibit raised, while others confirmed what they already knew, and some reflected on the educational significance of the exhibition. Encouraged by similar examples displayed on the exhibit wall, the box for mailing their comments provided visitors both a public prompt and an opportunity for private expression.

Identity and emotion

My third example uses a more common approach: an open book where visitors might write remarks at the conclusion of an exhibition. Comments were written in a public space where they could be read and influenced by others, and I was interested in how this would affect what was written.

Titanic The Artifact Exhibit ran at the center from December 2, 2001, through June 2, 2002, and attracted a record-breaking number of visitors (approximately 350,000). Each day for the six months of the exhibition's run, I read the comments—more than 280 a day, 34,000 in all.

During the first week, the comments book contained blank pages with the name of the exhibition at the top. Page after page after page, visitors simply wrote the name of the person that had been given to them on a card they were given as they entered the exhibition. Towards the end of the experience visitors could look up the name on a large chart to see if they had survived or were drowned. The comments book had become a memorial. Staff would remove pages at various times during the day and in the newly blank book the lists of names would begin again. Perhaps 34,000 names would have piled up, had I maintained this approach and, arguably, that might have been appropriate. But I wanted to know more.

After the first thousand names or so, I added the simple phrase "Please share your thoughts" at the top of each page in the comments book. Reponses were transformed into something diverse, detailed, nuanced, and 99 percent complimentary, according to a random sample analysis of about a thousand. The comments were analyzed into 12 non-exclusive topics. Almost a quarter of comments included references to the emotions the exhibit evoked, and a fifth referred directly to the person on the card, or the writer employed the personal pronoun. Here are some examples:

> By the grace of God I survived. Most of the third class passengers died on the ocean on the horrible night, but I lived on, remembering forever details of the worst tragedy one can imagine. I pray that mankind might not ever see anything like it again.

> Through gaining an identity of one actually on the ship, I gained an attachment and hope towards my identity living. Thanks for a great insight!
>
> I lived. Why do I feel so guilty for living?

Sixteen percent mentioned some general or specific aspect of the exhibition's content, for example:

> I loved the sound and the sense of actually being on the ship. The grand staircase was amazing! The placement of artefacts was beautiful as well!
>
> Couldn't keep my eyes away! Very real—I became almost frightened as we headed down toward the engines. Nice sound! Bravo!

The next largest category for comments (about 10 percent) comprised moral observations, philosophical reflections, and religious thoughts. For example:

> Definitely worth the time and money even though we have all been deluged with "Titanic mania" all these years. It's great to hear the story and see all the artifacts in this most moving way. A definite tribute to all who died and lived at that far distant time. If we bring Titanic objects up we will be robbing the graves of over 1,000 people. If we leave them down there we will lose a historical landmark.
>
> Titanic shall always be the most dramatic manifestation of man's arrogance and defiance to life, fate, and God's will and sovereignty.
>
> A case of man getting too big for his britches.

Approximately 8 percent of comments included the feeling of "really being there" or a sense of eeriness. And lesser percentages (4 percent or less) commented on what they had learned, made historical references, or wrote about their general interest in the *Titanic* incident. Only one percent of comments included a reference to *Titanic* movies.

Clearly the exhibition evoked a powerful emotional response and, through the simple device of a card with a name on it—a device used at the Holocaust Museum in Washington and, I suspect, copied elsewhere—created an immediate personal identification. Other elements that helped form the reaction included the dramatic theatrical sets; a carefully ordered and choreographed series of immersion experiences to create a sense of "being there"; a tragic story that was already well known, including the general moral lesson of hubris; and this important addition of a real person to identify with whose fate, for most, was unknown.

My conclusions are that comment books can provide rich data, particularly when there is compelling content for the visitor to immediately react to. Small changes in wording, setting, and materials can produce big effects, suggesting that experimentation may be worthwhile and even necessary. While these data lack most demographic information, are unlikely to be random samples, and will inevitably be skewed to positive and appreciative statements[2], they nevertheless, I believe, can reveal a great deal about the affective domain of visitor experience and are messages in bottles that are well worth opening.

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What Visitors' Voices Can Teach Us

Wendy Pollock

Paulo Freire once said that "true education incarnates the permanent search of people together with others for their becoming more fully human in the world."[1] The accounts in this book, taken together, speak of such a search—collective, ongoing, with the texture and flavor of individual human life.

As Walker Evans's migrant workers have taken a place on museum walls alongside Rembrandt's merchants, so, too, our contemporaries' voices occupy a place in many museums today. Although some speak haltingly, and others are heard only by museum staff, an increasing number are actively critiquing exhibitions, expressing opinions, telling stories, and sharing insights. Thousands of individuals are represented in this book alone.

Now that these voices are here in all their variety, what are we to make of them? For one, we marvel—at the sheer numbers, the passion, the intimate details, the unexpected insights. I've been in the position myself of storing comment books for years, feeling an obligation to all of the authors who had taken time to write. This raises questions:

- What are our responsibilities to all of these authors—many, if not most, anonymous or known only as "Kevin, age 6"? Should we treat these writings as material to be studied and archived? As Richard Toon points out, they speak volumes about the nature of learning in museums; could they teach us more?

- Is it possible to deepen the learning and enhance the insights by modifying our designs? Would better materials, a comfortable place to sit, and a quiet corner provide more support for the "writing to learn" of which Bill Watson speaks? Could we redesign the interface of a recording booth so people more frequently listen to others' recordings before making their own? Several accounts make it clear that details matter.

- If we ask visitors their opinions about a matter of public policy, could we find a way to report the results to policymakers—as the Monterey Bay Aquarium has done, and the DeCiDe project aspires to do? Are there more effective ways to support those stirred to action?

- Now that we've found these messages in bottles, how do we respond? If there's an ocean in between, could we narrow it? Should curators post their own thoughts and reflections, as Hooley McLaughlin does in the Ontario Science Centre's *A Question of Truth*? Some newspapers now put their reporters online, to engage directly in dialogue with readers; some museums have undertaken

similar experiments, like Science Buzz. Is there any reason why we might not do more?

- How do we find the right relationship between the public's voices and those of staff and advisors with expertise? While we trust visitors, we also must retain their trust—arguably one of the greatest assets museums have. Wayne LaBar raises this question as he contemplates the possibilities of opening his museum's Exhibit Commons to online contributions.

- Finally, have we considered carefully enough the possible downsides of collecting and displaying visitors' fleeting thoughts as if they were so much wallpaper—brief, lacking context, only hinting at thought? In 1985, social critic Neil Postman wrote of the hazards of public talk that aims primarily to amuse—the direction in which, even then, television news was headed.[2] Talking heads don't constitute a conversation. Neither do Post-its, juxtaposed. They may attract attention and even provoke thought. But could we do more to foster genuine conversation in museums, around topics that matter?

We need not only to reflect ourselves, as Bill Watson suggests. We also need to reflect together, about the world that museums help us to explore. Talk alone isn't enough—someone needs to listen, think, and respond. "Real conversation catches fire," Theodore Zeldin wrote. "It involves more than sending and receiving information."[3] This takes time. As Barbara Henry's experience suggests, comfortable seating helps.

When minds meet around something we care about together—be it the pathos of a Rembrandt portrait, the green of a leaf, the quandary of wind power, the puzzle of the nanoscale—the civic fabric strengthens; hope grows.

Vishnu Ramcharan, who works with visitors on the floor of the Ontario Science Centre, believes that being able to open up dialogue and encourage questioning is one of the most important qualities of the museum educator. His words offer inspiration:

> When we share with visitors—in demonstrations, in other programs, on the exhibit floor—the idea is opening up, listening, understanding what is going on, and being humble. If we understand nothing else, let's carry that word forward: Be humble! You don't know it all. You can't know it all. Ask. Be teachable. Our job is not to see what we can teach people. It's to help find what they can teach all of us. We need to get it straight that understanding is what we need to engender and what we owe to each other. It is the work of love.[4]

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