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EXHIBITIONIST

Vol. 19, No. 2, Fall 2000 $10.00

A journal of reflective practice, published by the ***National Association for Museum Exhibition (NAME),*** *the Standing Professional Committee on Exhibition of the American Association of Museums*

"Still Life," Mark Tansey, 1982.

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How Can NAME Better Serve Its Community?

by Kristine L. Hastreiter

The cool nights and brisk mornings have settled in on Buzzards Bay. Soon the last of the summer tourists will pack up and depart, and the lean months of the off-season will descend on Wareham. By the time this issue of the *Exhibitionist* reaches each of you, the Wareham Historical Society will have closed its buildings for the winter. Thinking about all of this raises questions about how the Society could better serve its community, year-round. It is the same question that I ask myself when I think about NAME.

How can NAME better serve its community: a varied group made up of large, mid-sized and small museums; of entry-level, mid-level and senior level professionals; of individuals who work and live nation-wide; and who bring with them unique skills and talents? How can we as a community effectively work towards the common goal of making exhibitions, the product and the process, better? How can NAME meet the needs of so many constituencies? It is downright daunting when you think about it. And in my new role of President of NAME, I must admit, this is what keeps me up on those cool nights.

I would like to thank Whitney Watson, NAME's Immediate Past President, for all his hard work and for providing me with direction, advice and support as I grow into the position of President. I am confident that with our new officers and board members NAME will flourish.

At the Standing Professional Committees Council meeting, which was held at the AAM headquarters in Washington, DC this past August, members of the council and AAM staff came together to resolve questions and procedures concerning membership, finances, and the freedom to create programming responsive to the needs of individual SPCs. Among the agenda items were discussions about subscription vs. membership concerning SPCs; AAM's "Museums and Communities" initiative; the status of Independent Museum Professionals; and the rules for voting and holding office in AAM and SPCs.

Over the past few months, AAM has been actively addressing the issues associated with the status of Independent Professionals in AAM. The AAM Board had hoped to have some new definitions by this summer. However, the AAM Board reached an impasse on the issues associated with the status of Independent Museum Professionals because it is a complicated issue overall and the definition of a museum professional, those of us who make their living in and around museums, is changing. As a result, the AAM Board and Ed Able asked the SPC Council for their input and requested that the Council submit a proposal. The SPC Council sent forth the following proposal to the AAM Board:

> "Elected board members of Standing Professional Committees will be individual members of AAM with voting privileges. Independent Professionals can serve as non-voting appointed Board members of SPCs. The assumption is that this category of SPC Board membership will constitute the minority. Independent Professionals are eligible to serve as Program Chairs of SPCs if they are the best qualified for the position. This assumes that this is an appointed, not elected position, and will necessitate a change in the by-laws for some SPCs. Existing program review structures are strong enough to prevent conflict of interest."

The AAM Board will be reviewing the SPC Council's proposal at their fall board meeting and will hopefully make some decisions regarding the status of Independent Museum Professionals soon after.

Cover Illustration from *The Metropolitan Museum of Art*, Purchase, Louis and Bessie Adler Foundation, Inc. Gift (Seymour M. Klein, President), 1982

Stories We Tell About Exhibits

by Jay Rounds

Mike Spock and his associates have been doing a great job of demonstrating the usefulness of the stories that museum professionals tell about exhibit experiences. (See, for instance, Mike's article in the Fall 1999 *Exhibitionist.*) Stories usually have a hero, or at least a protagonist, and it has occurred to me, in attending to stories about exhibits, that there are at least four distinctively different types of such stories, distinguished by the definition of the protagonist.

The Journey

The first type of story focuses on information, and traces the path of some bit of information as it travels from source to destination. The source from which the fact departs on its journey (or at least the most immediate source) is the individual or team responsible for the creation of the exhibit. They have placed the information in the exhibit with the more-or-less conscious intention that it will migrate on to visitors. The visitors constitute the destination. The stories told in this model are tales of success or failure: the fact does or does not survive its perilous journey. It arrives intact and triumphant in the head of the visitor, or it dies along the road. Sometimes it disappears mysteriously during the journey, and is replaced by an imposter, a changeling, a cuckoo in the nest. The visitor receives information, but not the correct information. Whatever the denouement, the fact serves as the protagonist of the tale, and the curators/designers/developers merely the travel agents, the facilitators speeding the fact along its way. Tales that end in tragedy—in a failure of the fact to reach its destination—are typically attributed to the ineptitude of the travel agents or to a lack of receptivity by the destination, which proves to be a Philistia whose gates are closed to the serious, the meaningful or the merely difficult hero of the tale.

The Marketplace

The second type of story is a tale told in a marketplace. Facts are still central to the story, but they are reduced from heroes colonizing new territories to commodities being hustled in the marketplace, striving to attract buyers. Those buyers—actual or potential visitors to the exhibit—are understood to be somewhat mysterious creatures, pursuing personal and perhaps idiosyncratic agenda, assembling portfolios tailored to their own needs. The true protagonists of these stories are the exhibits people in the role of marketing gurus. They conduct arcane research to discover the personal agenda and hidden motivations of the targeted market segment, and apply skills in eye-catching packaging, clever manipulations of the allocation of shelf space and similar tactics to circumvent potential barriers to the sale and to induce the customer to buy. A happy ending rests in a successful sale—though with some lingering discomfort concerning how the facts thus marketed are impacted by the way visitors store them within those idiosyncratic portfolios.

The Artist

The third type focuses on the exhibit creator(s) as artist. While facts may be among the materials brought to bear by the artist, the real subject is some compelling inner vision that is to be made accessible to the visitor. Rather than acquisition of some set of objective facts, the visitor experiences a glimpse into the being of another person, or peers through a window that reveals something of the essence of the workings of the world.

In this type of story the burden is not on the exhibit creator to understand the visitor, but vice versa. Visitors are challenged, as a matter of personal development, to hone the specialized skills necessary to decode and interpret the representations of the artist. This need not be regarded as arrogant disregard for the visitor, if we can agree on the value of art and on the value of

experiencing art. All tools require us to learn the skills of their use in order to reap their benefits. And after all, the point for the visitor is to seek a transformational experience, one that gives him or her new eyes with which to see our world in fresh new perspectives. To gain this experience, we must voluntarily submit ourselves to the vision of the artist, at least for a brief time.

The World Constructor

The first three types of stories have cast as protagonists (1) facts themselves, (2) exhibit creators as marketers of facts, and (3) exhibit creators as artists. The fourth model places the visitors in this central role: visitor as world constructor. The tale centers around the visitor, for whom the exhibit experience is a moment in a continuing stream of experiences—some deliberately sought out, others accidentally encountered—through which the visitor constructs a personal, increasingly rich interpretation of the world, the self, and the meaning of it all. Facts figure in the story, but—like electrons waiting for Heisenberg to peer at them—facts are neutral, as colorless as the preferred décor of real estate agents, until a visitor perceives them and grants them a place in one of those personal constructions. So incorporated, their actual meaning is positional, dependent upon the specifics of the personal construction into which they have become assimilated. The individual construction is likely to reflect broadly-shared cultural understandings—but that is another story.

We use such stories as a way of making sense of our complex work. The choice of story type thus has real consequences for the way we practice. In the first three types our own roles as exhibit professionals are clear, though different. In the fourth, though, it is much less clear what role we play in moving along the story—a point made clear by Kathy McLean in this issue's cyber-forum. NAME is planning a session at next spring's AAM meetings in St. Louis that will focus on this issue of the implications of meaning making for the role of the exhibit professional. We hope to see you there!

"Rebecca at the Museum: Mexico City, 1967": ©Jay Rounds

Exhibits Newsline

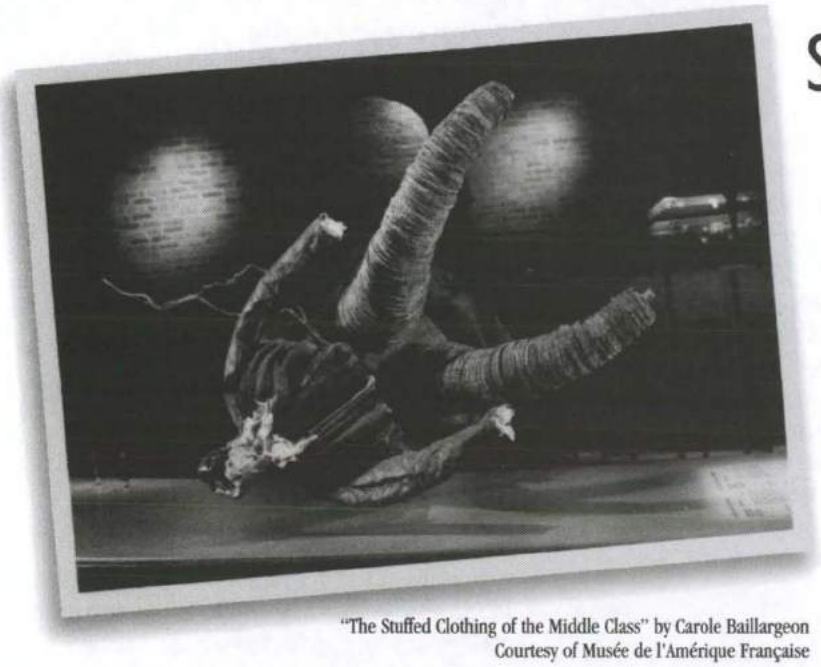
by Phyllis Rabineau

Phyllis Rabineau is Deputy Director of the Chicago Historical Society. She can be contacted at: rabineau@chicagohs.org

Over the last few months, I've been fortunate to see a few wonderful exhibits on my travels here and there. I'm indulging my enthusiasm through fairly in-depth coverage of these installations, and then I'll follow up with the usual farrago as brought to us by "Exhibits Newsline's" contributors, both regular and irregular. (As you will see, this is a particularly fitting description for the last item in this installment.)

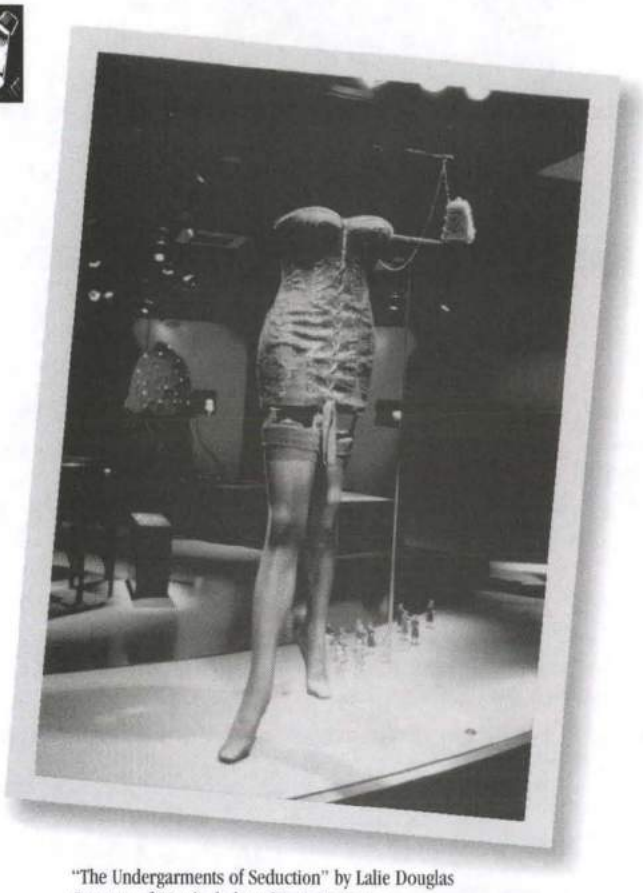
My new colleague, Tamara Biggs, raved about an unusual exhibit at the Musée de l'Amérique Française in Québec City. She told me it was the best history exhibit she'd ever seen, and since we're in the business of Making History Happen, earlier this spring I went to check it out. Her praise was well-deserved; I've never seen another museum exhibition resembling this, and rarely one that so successfully explores not only the events of history but also the emotions of those who lived it.

The stories evoked sorrow, horror, awe, wit, and amazement.



"The Stuffed Clothing of the Middle Class" by Carole Baillargeon
Courtesy of Musée de l'Amérique Française

"Ludovica: Stories of Québec City" arose conventionally enough from nineteen archival documents, each highlighting a moment in Quebec history; the original documents were respectfully displayed in the exhibition space. But beyond this, the project took off into the realm of theater. Designers transformed the museum gallery into a mysterious, dim, dream-like setting where visitors encountered a circular arrangement of original costume—sculptures placed in pools of light, and smaller niches around the periphery housing installations based on clothing accessories (gloves, socks, blindfold, collar, and a cravat). Stopping at each sculpture, visitors listened on headsets to a fictitious first-person narrative describing the experiences, hopes, sorrows and exaltations of a character who might have witnessed the events recounted in one of the documents. Music and sound effects enhanced each 3-5 minute story. A brief text next to each sculpture set the time frame; examples included Clash of Cultures 1630 (the decimation of native peoples through smallpox-infected blankets); Passage to China 1634 (Québec's role as base for French exploring the Great Lakes); City of Vocations 1714 (life in a Catholic community); City of Light and Science 1880 (an amateur experiments with electricity); City of Genius and Audacity 1916 (the tragic collapse of a St. Lawrence River bridge); City of Paradoxes 1953 (the city's lingerie manufacturing industry). Appropriate to each episode, the stories evoked sorrow, horror, awe, wit, amazement.



"The Undergarments of Seduction" by Lalie Douglas
Courtesy of Musée de l'Amérique Française

The Musée de l'Amérique Française showed extraordinary vision in turning to Québec's artistic community to realize this project. "Ludovica" (Champlain's original name for the city in honour of King Louis XIII) was conceived by Michel Marc Bouchard, a well-known Québec playwright, who wrote the exhibition script; the soundtrack was a production of Radio-Canada's cultural network, and local actors (including internationally-known Robert Lepage) lent their voices to the characters. The costume-sculptures were specifically designed for the exhibition by artists Lalie Douglas, Carole Baillargeon and Daniel Castonguay. Unfortunately, there is no catalogue.

Another powerful historical experience awaits visitors at a pair of attractions devoted to a Great American Disaster—the Johnstown Flood Museum in (you guessed it) Johnstown, PA, and the Johnstown Flood Memorial in (you probably didn't guess this) St. Michael, PA. Both tell the story through excellent films that dramatically reconstruct the events leading up to, and resulting from, the 1889 collapse of a dam upriver from one of the leading steel manufacturing centers of the day. The tragedy is explored at each venue with subtle differences in interpretation, although each acknowledges the main themes that led to the disaster—class inequality and technological arrogance. (The dam created an artificial lake for a country club of Pittsburgh's titans of industry in blithe disregard for the safety of the industrial workers downriver.) And neither museum pulls any punches in recounting the grisly details of human and property damage that was wrought when a three-mile long lake drained in 40 minutes, propelling a 75-foot high mountain of water down a narrow valley at speeds up to 40 miles per hour, and pushing ahead of it a wall of debris: houses, trees, locomotives, human beings and livestock, and the entire output of a barbed wire factory—three miles of wire in which hundreds of people became entangled. Over 2,200 people died, including 98 entire families. The films are definitely not for the faint of heart, with explicit images and wrenching narratives drawn from first-person accounts. Both installations also feature reconstructions of the debris wall. There are already formidable attractions to be found in the area, with its beautiful landscape, and nearby Frank Lloyd Wright's masterpiece Fallingwater. Another new museum, telling the story of immigration to western Pennsylvania, will open in Johnstown this November.

Just a few weeks ago, my family visited Ireland, and, being Irish music enthusiasts, took the opportunity to visit Dublin's brand-new attraction, The Irish Traditional Music Centre, or Ceol (say "keyhole" as one syllable). Housed in a shopping/hotel complex, and located appropriately adjacent to the Jameson's whiskey distillery (yum), Ceol offers the most up-to-date AV and computer methods so visitors may explore the history of Irish music from medieval times to the present. We found an introductory video, combining contemporary and archival footage, in a circular room surrounded by an environmental sculpture representing hundreds of men's coats hanging on pegs around the wall; as we watched the video, we stood among six or seven sculpted figures of musicians with fiddles, flutes and accordions in hand. Next, interactive computer stations invited us to thoroughly explore the history of Irish music and its intimate connections with Irish politics. An oral history room featured audio selections of old-timers' fond memories of friendships, quarrels and courting at social gatherings in rural settings where music and talk provided all the entertainment. The next display featured examples

Powerful historical experience awaits visitors at a pair of attractions devoted to a Great American Disaster.

of the main Irish instruments—less than a dozen real artifacts comprising the only "real" things in the museum! A listening station provided hundreds of selections by the very best musicians, recorded over the past 80 or so years. A children's area invited younger visitors to learn about the instruments through physical interactivity, and additional video installations were devoted to vocal music and dance. The museum's spectacular ending was a 180-degree wrap-around film that put us smack in the middle of music-making where it really happens—pubs, kitchens, street corners, pubs, fishing shanties, pubs and more pubs. Our crowd of well-informed critics gave Ceol a thumbs-up for both content and fun.

Now, on to the latest words from our contributing writers. Intrepid correspondent Gene Dillenburg remains one of my stalwart sources. Recently, he passed news of a small museum on the campus of Sonoma State University in northern California. Assistant Professor Scott Gordon curates the World Famous Asphalt Museum with holdings that include chips of world-famous Route 66 and California Coastal Highway 1, not to mention a section from the Appian Way. Of course, this museum hosts traveling exhibits, and past installations have included a road reflector from Stanford, CA and a piece of the Berlin Wall. The museum does have some limitations on visitorship, as it is housed in Prof. Gordon's office and open only during his office hours. If your taste runs to greensward rather than blacktop, you will have to go further afield, to the British Lawnmower, located in Lancashire. Here you'll find a display of over 200 vintage mowers, including Lawnmowers of the Rich and Famous (Prince Charles and Princess Diana) as well as the fastest lawnmowers in the world and the most expensive lawnmowers in the world. The museum promises its mission is to keep "a small part of British engineering heritage alive. BRITISH AT ITS BEST."

Gene also thought our readers might be interested in three midwestern museums, all focussed on one form of vehicle or another. Located on Selfridge Air National Guard Base, near Detroit, MI, the Michigan Transit Museum operates retired Chicago rapid transit cars on a nine-mile trip, a tour on which visitors can gawk at such relics as an old Detroit streetcar that operated for over a million miles on the Mexico City subway system, and a 99-ton diesel locomotive. And, if railroads just aren't your thing, you can hop off the train and spend an hour or so browsing among Selfridge's collection of 23 aircraft, mostly of Korean or Vietnam War vintage.

Interactive computer stations invited us to thoroughly explore the history of Irish music and its intimate connections with Irish politics.

From Kansas City, MO, comes news of the Arabia Steamboat Museum built in 1991 to house what could be salvaged, and

other items that have been recreated, from a vessel that sank in the Missouri River in 1856. Like a floating K-Mart, the *Arabia's* cargo consisted of hardware, dry goods, housewares and other essentials for pioneer life. She was carrying more than 200 tons of cargo from St. Louis to Sioux City. Motivated by rumors that the ship's sidewheel was crafted from gold and silver, and by the opportunity to salvage the 400 barrels of Kentucky whiskey that went down with the ship, efforts to save the *Arabia* began in 1877. Over the years, the Missouri River bed shifted, and in 1988, after a three-year search, a group of steamboard enthusiasts found the ship buried under 45 feet of silt in a Kansas farm field, half a mile from the present river course. The resulting excavation uncovered the largest collection of pre-Civil War artifacts in existence—4,000 pairs of leather boots and shoes; 65 bolts of fabric; china; brass buttons; thousands of needles and pins; hundreds of jars, bottles and tin cans containing pickles, pie fillings, cheese, catsup, oysters, champagne and more; elegant jewelry; fur coats; coffee beans; cigars; bottles of perfume and writing pens from France. Incredibly enough, nearly everything was undamaged. Today, the museum's display area is 30,000 square feet and features not only selections from her cargo but also a full-scale paddlewheel and replica of the *Arabia's* main deck with its original boilers, engine and anchor.

It's as if **the writers** for the **Simpsons** designed the exhibit.

Finally, in Omaha, NE, the 300,000 square foot Strategic Air Command, which also opened in 1998, preserves 31 aircraft and 6 missiles, and interprets the SAC and its mission. Visitors can watch volunteers work on restoring vintage aircraft, ride in a flight simulator, or for the hardware geeks among us, simply wander from one sleek bird to another.

Going from history to natural history, Marjorie Schwarzer suggested this column give a mention to KattenKabinet located in Amsterdam and billed as the world's only museum devoted entirely to cat art through the ages. Janice Klein forwarded news from Tokyo of a unique exhibition of flyswatters recently on view at the Ota-ku Museum of Local History, featuring about 130 flyswatters from 30 countries, including a handgun style from the United States, a badminton racket from China, and a soccer ball-shaped swatter from Germany. An innovative geological approach can be found online at the Dirt Museum with its wonderful database categorized by a dozen or so typological descriptors, and contributions ranging from around the world. Follow the dirt with the Lee Maxwell Washing Machine Museum in Eaton, CO, where you can observe 600 fully restored machines (and another 260 awaiting restoration) in 12,000 square feet of climate-controlled exhibit space. And finally, Adam Gertsacov reported: "I just saw the Grossology exhibit at Toronto's Ontario Place. It's as if the writers for the Simpsons designed the exhibit! Here are some of the stations: The Urine Game (a video game); the GI Slide; a walk-in nose that you tickle (and it sneezes!—unfortunately you don't get a little wet); a machine that simulates vomiting; a pinball where you have to hit gassy foods, and when your gas ball escapes, the machine shouts "The bacteria has left your body!"; a gross smells exhibit where you have to guess whether a particular smell comes from someone's armpit, feet or anus! And probably six or seven other exhibits. The whole exhibit was very slick, and lots of kids seemed to really love it."

I don't think there's any possible way to follow that item, so, 'til next time—keep those cards, letters and e-mails coming!

Musée de l'Amérique Française
www.mcq.org

Johnstown Flood Museum
www.ctcnet.net/jaha/pages/jfm/jfm.htm

Johnstown Flood Memorial
www.nps.gov/jofl

Ceol
www.ceol.ie

World Famous Asphalt Museum
www.cs.sonoma.edu/~sgordon/asphalt.html

British Lawnmower Museum
www.dspace.dial.pipex.com/town/square/gf86/index.htm

Michigan Transit Museum
www.alexxi.com/mtm/index.html

Arabia Steamboat Museum
www.1856.com

Strategic Air Command Museum
www.sacmuseum.org

KattenKabinet
www.kattenkabinet.nl

Dirt Museum
www.planetcom/dirtweb/dirt.html

Lee Maxwell Washing Machine Museum
www.oldewash.com

Grossology at Ontario Place
www.ontarioplace.com/grossology1.html

Current Literature on Museum Exhibition Development and Design

by Jane Bedno

Jane Bedno is Professor and Director of the Graduate Program in Museum Exhibition Planning and Design, Department of Museum Studies, The University of the Arts, Philadelphia.

Recent books on museum exhibit design and development prove useful for novices, but experienced designers will find older, out-of-print sources more valuable and inspiring.

Museum exhibition development and design are central to most readers of *Exhibitionist,* and, because most of us are both pack rats and information junkies, we tend to collect anything we can find that will help us in our work. There are a number of possible reasons to buy books on museum exhibition development and/or design, but I assume that practicing professionals are primarily looking for really useful how-to materials on a professional level for ideas and visual material that will excite them when they are feeling the need for professional rejuvenation. If so, they will have to look long and hard. Designers are people who are very visually oriented. They will find the currently in-print literature in the field surprisingly lacking in visual information. These books are almost all words, and the images they include are small and unsatisfactory—largely black and white (or, rather, gray and gray). This is simply the reality of contemporary publishing. The demand simply doesn't justify marketing specialized books for a very limited audience, such as "coffee table books" with many beautiful colored illustrations.

For the relatively inexperienced, there are three serious books now available: Kathleen McLean's *Planning for People in Museum Exhibitions,* David Dean's *Museum Exhibition Theory and Practice,* and Michael Belcher's *Exhibitions in Museums.* In the last twenty-five years, several other, and, in some cases, more ambitious books have been published, but they are unfortunately out of print. For readers who may be able to find them in libraries, I will discuss them later.

Most of my discussion is based on my sense that there are two parts to the creation of exhibits, which most authors see as distinctly different: planning (now usually referred to as development) of the basic concept, and design, which translates the concept into physical form. Although this may seem a little simplistic, the books I discuss clearly focus on one or the other, even if they contain significant discussion of both.

Designers will find current in-print literature lacking in visual information.

The books I name are strong primarily in the area of conceptual development of exhibits. Design is given relatively lighter attention. I will discuss Kathy McLean's book first as the best all-round source for basic information on exhibition creation. Since McLean's book is called *Planning ...,* my comment that it is stronger on planning issues than on design is neither a surprise nor a negative criticism. I simply mention it since the authoritative book on design of exhibits has yet to be written. McLean's book is particularly strong in the area suggested by the second part of the title—*People in Museum Exhibitions.* As many museum exhibition personnel may be unused to focusing on their intended audience and effectively using information gained from visitor studies, this discussion can be of great use to many experienced developers and designers, who frequently come to museums from backgrounds devoid of any study of their intended audiences. Indeed, in older professionals, a certain arrogance as to their ability to create without paying much attention to the audience is often present. I have clearly positioned myself in favor of audience research and visitor studies. However, such studies always show people as more receptive to ideas and approaches with which they are somewhat familiar. Some provision must be made for entirely new approaches, for unpredictable creativity. Remember the audience testing of "Seinfeld" which showed that the public neither liked nor understood the program. The organizers decided to put the show on anyway, and the rest is history. In most American museum settings, it is extremely difficult to justify experimentation, yet the future of exhibition depends on going beyond reworking of understood formulae.

I consider the planning model described by McLean to be the best current practice, but it is not universally accepted, particularly in museums of art, and the solo auteur/entrepreneur is still an

important player (witness the exhibitions "Ramses the Great," "Nicholas and Alexandra," for example). The team model certainly seems generally applicable, and one would like to see it spread. The discussion of teams is useful, particularly for readers faced for the first time with the task of assembling one. I think the model used in this book is already undergoing a sea-change, however, since its publication. The educator's role is no longer just to ensure that the physical exhibition achieves educational goals, but that it will facilitate programming in a much broader sense. Many museum teams will find marketing people weighing in to this process, to assure the marketability, particularly in programming, of the exhibit. If I have any problem with the book, it is the model itself, as I think it has often led to bland exhibits that rule out humor, beauty, anger, and public discourse.

Nuts and bolts are sometimes missing. In McLean's criteria for "Assessing the Exhibition Idea," for example, the issue of time is missing; after all, scheduling is critical to many exhibitions (can the exhibition be satisfactorily completed in the time available?). A discussion of scheduling techniques would have been very useful, as there is some predictability about the proportions of time available that need to be allotted to the stages of conceptualization and production. Many museum professionals faced with the question of whether an exhibit is fundable will look for further advice to determine what the proposed cost for production is likely to be. Although no book with any expected shelf life can suggest actual figures, the proportions of cost that must be allotted to specific aspects has changed surprisingly little over the years. To ascribe this kind of information only to the expertise of "experienced exhibit organizers" ignores the fact that even the beginner might be helped by understanding the relative cost of elements with which he or she is dealing.

McLean's book is logical, reasonable, and will lead readers in the right direction.

Consistent with the relative lack of emphasis on design, a discussion of the aesthetics of exhibition is almost entirely missing. Aesthetics is a difficult word to use, but I cannot find another adequate term. I am speaking of awe, of the affective, of the aspect of exhibits that can make some of them deeply memorable. In keeping with an article she wrote some years ago, McLean clearly believes that the design of an educational exhibit is of a different nature from the creation of a beautiful or moving exhibit. I think many (including me) would, to some extent, disagree. I believe that any book which attempts to be comprehensive on the subject of exhibitions needs to address aesthetics. Early in her book, McLean mentions the concepts of "dream space" and that recent studies at the Smithsonian show how important the "introspective" aspect of exhibits is, and that many visitors go primarily to find this quality. The repeated idea that people are looking for the reverential in museums reinforces this idea. Having mentioned this aspect of the museum experience, very little in McLean's book gives us any help in planning and designing for it. There is not much help in the area of visitor studies. Readers who are familiar with "The Grand Hall of Evolution" of the Museum of Natural History in Paris, or the Carl Akeley dioramas at the American Museum of Natural History will understand what I mean. Neither of these would be the brilliant, moving experiences they are if they had simply been designed logically. Designers of commercial facilities such as Disney have long understood the power of the aesthetic aspects of the "edutainment" they present.

McLean's chapter on interactives is sound, particularly the discussion of practicalities of creating these exhibits. She narrowly defines "interactivity" as a concept that does not include "participatory" or "hands-on," and does not discuss how and when to create participatory or hands-on materials. In a basic book, such a discussion would have been useful.

The book is very limited in its discussion of alternative information sources for the visitor—i.e. the use of media. This can be ascribed to the leaps that have taken place in technology since it was published. A new book would talk more about digital technology and the web as alternatives or additions to print interpretive graphics, and include many other electronic devices that now have a place (such as motion-activated exhibit elements and, soon, hand-held informational devices personal to the carrier).

In her discussion of the major components of design, McLean bravely condenses a great deal of literature into a couple of short chapters. This material is very much for the beginner but it is very sound, as far as it goes. A few elements are entirely missing. For example, the legal requirements of accessibility are discussed, but comfort isn't. Another example might be the element of sound. Although most visitors are dominantly visual in the way they source information, a significant minority of visitors is primarily auditory. Here I am not speaking about visually impaired individuals, but people, such as musicians or linguists, who don't seem to care what their clothes or homes look like. Designers are visual people, so they must be told and reminded how to deal with this part of their audience.

McLean's whole book is logical, reasonable, and will lead readers in the right direction. Allowing for the time that has elapsed since its publication, it accurately reflects the model now used by the best practicing exhibition planners and designers. I have used McLean's book as a teaching text, and this may have been part of her intent.

Dean's book, *Museum Exhibition Theory and Practice,* is more focused on design factors than techniques for conceptual development of exhibits, but generally covers much of the same ground as McLean's. There is a short discussion of the exhibit team and management structure, and none of the creative processes essential in the developmental stages. Placing exhibits onto a sliding scale between

object display and information display seems simplistic (where do phenomena and environments fit on this scale?). Throughout, Dean feels an urge to simplify, which is completely reasonable, since the acknowledgments that precede the text state that "this book is a product that resulted from the need to have a text for teaching exhibition design." This is a book for neophytes rather than experienced professionals.

Some of Dean's language is puzzling, as it sometimes doesn't seem to follow usage in the field. An example of this is found in comparing the two books' outline breakdown of the development process. Dean's is in greater depth, but McLean's tallies with all of my experience, even though it is more cursory on a number of subjects. Dean is more practically oriented in defining time management as essential and in discussing money. The difference is minute, however, since neither book gives any real, substantive guidance on matters of scheduling or budgeting. The chapter of the book titled "Audiences and Learning" is more conversational in tone, and more based on environmental psychology than McLean's, which draws heavily on the literature of visitor studies.

Michael Belcher's *Exhibitions in Museums* also has the feeling of having been written as a text primarily for the inexperienced. It seems to me to be less useful to the beginner than the previously discussed books, but, on a few points, it addresses important subjects that are hardly there in the previous books.

Belcher's book is much more comprehensive, tackling a wider range of issues, including museum planning, policy, and practice, and the marketing function. McLean's book doesn't pay much attention to the distinction between collecting museums and non-collecting museums that focus on creating meaning—an approach more typical of the exhibit process in science museums than, for example, museums of art. Belcher assumes that it is part of the very nature of the museum to have a collection, and the display of this collection is the central issue in creating exhibitions. He talks at some length about the exhibition aesthetics, and provides a usefully evenhanded breakdown of types.

Belcher is less satisfying on the subject of the creation of exhibits. He assumes a fairly traditional, curator-driven process in which the curator prepares the "brief" and the designer and educator are responsible for "answering" it (Belcher's words). The term "brief" is English usage, and I wish that American writers would adopt it. The idea of producing a clear, short, written document summing up the overall intent and approach for an exhibition can be extremely useful, and the vague character of the American equivalent may be much less functional. Likewise, I agree with Belcher's insistence on a working title, not mentioned by McLean or Dean.

Belcher touches on a few matters relatively lightly addressed by the previous writers. His discussion on design is lucid, though brief. Belcher is the first of these authors to write as if he had real personal understanding of design process and design requirements. The section is not very useful to designers working in a non-collections context, however, as Belcher is primarily discussing the design of exhibits of objects. Belcher does not touch on the "hows" of the creation of exhibits—that is McLean's territory. He includes a very sound, comprehensive discussion of visitor studies, but separates it from his general discussion of exhibition development as if it is a separate and arcane subject. Overall, the book may be a useful addition to the library of someone trying to understand the parameters of current practice and as a source for checklists and basic questions to be considered in the development of collections-based exhibits. How one wishes that he could have utilized color in his illustrative materials!

Belcher's discussion on design is lucid, though brief.

McLean's bibliography is both extensive and wide-ranging, listing sources outside the professional museum literature. Dean's draws almost entirely from the literature of museology. I consider this a serious shortcoming, as the readers who wish to extend their range of thinking about the possibilities of exhibition planning and design beyond the limits of current practice must go beyond the literature of that practice. Belcher's bibliography is, like Dean's, almost entirely limited to museum literature, although it is very extensive.

For the international users of these books, another issue is apparent. The majority of the discussions in all of these books, even Belcher's, are based on a perspective and research that is western, primarily American, making it unclear whether the books describe a universally applicable model or simply a western one. It is hard to answer this question, as the data aren't around in English to provide the needed information. Certainly cultural traditions regarding space, color, and smell differ widely throughout the world. Recent research indicates differences between Asian and Western brains—the first looking at objects primarily in context, the second as stand-alone objects of varying importance. This is very interesting in its implications for those creating educational materials.

None of these books addresses current technological possibilities in exhibits, and this should come as no surprise, as this field has developed at breakneck speed in the last few years. Some good new books discuss the subject, but (in the ones I have read) fail to integrate it successfully into the more general subject of exhibition development and design.

I earlier mentioned several out-of-print books that I recommend to readers, if they can find them. Interestingly, though more recent books primarily focus on the development of exhibits, the majority of these older books concern

the design of exhibits. The first and most important is Margaret Hall's *On Display: A Design Grammar for Museum Exhibitions.* Although published in 1987, I still find this book rewarding to reread, and I find it hard to fault. It is tragic that it was almost immediately allowed to go out of print.

After a relatively brief introductory section on the history of exhibitions, their general characteristics, and their conceptual development, the first half of Hall's book is spent on a discussion of all the issues that the designer will need to address, with nuts and bolts advice on how to do the job. The second half is an encyclopedic discussion of how to display any class of objects or subjects that the exhibit designer is likely to encounter. Although only in grayed black and white, the pictures are comprehensive and extremely useful. This book is a joy to both the beginner and the experienced designer, and probably the reference I find most valuable.

Exhibits: Planning and Design is brilliantly illustrated in large formal color. This is a designer's book.

A seminal book by Roger Miles, *The Design of Educational Exhibits,* covers almost everything that Hall doesn't. Miles, at the British Museum of Natural History, was a pioneer in learning theory, the use of visitor studies, and the team process in exhibition development. This is the first contemporary book on exhibition development and design, and it is very interesting to read for this reason, if no other. In some ways, this book seems the model for Dean's book. Miles' concept of the basic team is very different from that of later writers: he suggests a partnership between a rationalist, whom he describes as a scientist, and someone primarily gifted with imagination, the designer. He thinks of the exhibition as a series of exhibits, a model still followed in current practice in many exhibitions that are not primarily immersive. If the reader allows for the fact that practice has changed over the intervening years, the experienced professional may find concepts and discussions that are still very much of interest.

Giles Velarde's *Designing Exhibitions,* another English book, is again primarily addressed to designers, and only shows its age in terms of the subjects it doesn't discuss. In terms of general practice, it is well written and presented with very good visual material, a lot of which is in color. A new edition is to be issued next spring.

Last but not necessarily least, Larry Klein's book, *Exhibits: Planning and Design* is lovely to fondle and review. The text is very basic, but sound. The reason to own the book is that every subject is brilliantly illustrated, in large formal color. This is a designer's book. There is no mention of visitor studies, learning theory, or any of those subjects central to exhibit planning in 2000. But half of the book is dedicated to clear, appropriate, and beautifully illustrated case studies, each containing more information than is given in the other series of exhibition case studies (*Print Casebooks: The Best in Exhibition Design,* Volumes One through Ten) that provide in-depth visual information.

Among sound general museum publications, Eilean Hooper-Greenhill's compilation *The Educational Role of the Museum* exemplifies a reading that has something to offer the exhibition professional, particularly as the roles of the exhibition creator and the educator draw closer together. About half of this book directly concerns itself with exhibition development issues, with essays by a range of writers. The problem with such essay compilations, however, is that any good library, personal or public, will have much more organized and comprehensive materials on all subjects covered in essays. A short essay on Spatial Considerations, for example, cannot attempt to say all that a serious reader will find available in in-depth studies. We must all measure our available time and how fully we wish to develop our personal or institutional libraries. Too much of current museology literature is more in the nature of professional journals sold as books than as true books, and it is often extremely repetitive. No one expects a selection of short essays by different writers to turn into a coherent book, but such is the nature of most of the professional books offered to us.

You want to know how to get better and more imaginative at developing and designing exhibitions? Go to as many exhibits as you can, read everything, go to the movies, watch TV, keep open to ideas coming from everywhere.

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How Do We Look? Some Thoughts on Critical Reviews of Museum Exhibits

by Robert R. Archibald
with commentary
by Nicola Longford

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Given the rapid changes sweeping through the field, is appropriate criticism of exhibits really possible?

What is the point to exhibition criticism? Businesses seek customer response and reaction to the quality of services and products through surveys, focus groups, customer comment systems, and personal interviews. In most industries consultants and various forms of data collection provide information on best practices and industry standards. Comparative data is gathered through review of practices of competitors. All of this is done to increase profits and expand market share by maximizing customer satisfaction, reducing costs, and gaining competitive advantage.

Is exhibition criticism done in museums to expand market share, or as museums would phrase it, to increase visitation due to enhanced visitor experience? I suspect that some of the debate over the appropriate standards for exhibit evaluation is a consequence of lack of clear objectives. Sometimes we are concerned with visitor experience, and to investigate we use focus group techniques, visitor surveys, and formative and summative evaluation. But we also invite at least two distinct types of peer review: review by experts in the appropriate discipline and review by exhibit developers, designers, and other museum professionals.

Visitors are not oblivious to content, and reviewers with either a disciplinary or museum expertise are not unaware of the importance of visitor experience. Nevertheless the perspectives of each as expressed in published articles are very different. While the different types of reviews are hard to define, they generally vary based on the perspective of the author and the review's intended audience. A cursory survey of reviews published in my own field of history confirms the distinction. The perspectives of reviews in the *Journal of American History,* for example, are generally by historians for historians emphasizing historical content. Even *The Public Historian* reveals a decidedly academic bias.

> We do not have an integrated approach to either exhibition review or evaluation.

We do not have an integrated approach to either exhibition criticism or evaluation, nor does an appropriate venue exist for dissemination to those who participate directly in the exhibition development process. This lack of coherence is a consequence of the exhibit research and development process which is inherently multi-disciplinary and collaborative, reflective of a delicate balance of disciplinary standards, conservation concerns, community expectations, the importance of exhibition design, and the visitor experience. Exhibitions are the result not of an individual vision or effort, but rather are the product of an intensely collaborative process that requires skills as diverse as those reflected in nearly the entire range of academic disciplines plus those of conservators, designers, media experts, teachers, and increasingly includes participation by members of the intended audience. Currently, for example, the staff of the Missouri Historical Society is developing an exhibition on the Bosnian immigrant community in St. Louis. An appropriately multi-disciplinary staff team meets regularly with residents of the Bosnian community to develop exhibition themes and content. While staff facilitate the process, insure accuracy, and develop design, the exhibition really belongs to the community. It is their story told from their perspective. I am not going to examine the potential perils of this process here, but I will

underscore the integral role of the interested community in the development of many exhibitions.

The question is, what process of exhibition criticism is credible, valid, and useful to all those involved in the development process? Is it experts from appropriate academic disciplines, or is it visitors, or design experts, or museum administrators? The findings of David Thelen and Roy Rosenzweig as presented in *The Presence of the Past* suggest that the extraordinary credibility assigned by the public to history exhibits is a result of the public's perception that history exhibits are less mediated and hence more "truthful" than other sources of historical information. Interpretation and object information may be required to establish object identity and context, but from the public's perspective the credibility of the exhibit depends on direct interaction with objects and the freedom to establish meanings without third party interpretation.

Cliché though the phrase has become, a paradigm shift really is occurring, and museums are in a formative stage that makes evaluation of exhibitions difficult since at such a stage little consensus on the criteria for evaluation is obtainable. Certainly we know that design must display technical competence and that interpretation must be both accurate in fact and plausible in theory. Beyond this, however, there is little agreement on the definition of excellence. The moving waters that currently stir much debate over what museums are and what their roles in society ought to be are only a reflection of the dissolving of uniformity and conformity in our society generally. Museums are just now responding to the new dynamics of a society that we all acknowledge as diverse and multi-cultural. The concept of museum as purveyor of common culture is not relevant now, and the old norms that insist upon a common definition of culture as a social glue are no longer applicable. The old orthodoxies are obsolete and ineffectual, and we are only beginning to find replacements. While we cannot define these new standards precisely, we do know that they will be radically democratic and inclusive of multiple viewpoints. But what values will assist in sorting out the cacophony of new voices that demand inclusion in our society, in our museums, and in our communities? In this period of shifting expectations, evolution of new value systems and competing notions of museum roles, exhibit purposes, and underlying social values, the problem of critiquing exhibitions is daunting, if not impossible.

The problem of definitions has fascinated me, especially in my volunteer role as leader of the Museums and Community Initiative under the auspices of the American Association of Museums. In this and other dialogs of late we wrestled with a precise definition of a museum—"Does a museum collect or not? Must a museum display real things? Is a virtual museum possible?"—and then relinquished our efforts. Defining community is no easier. Is a community a place, a geographic space? Can you define community boundaries with any precision? Does any town or city or state or nation consist of just one community? The problem of definitions which seems boundless now is really one more symptom of those paradigm shifts that are changing the world beyond our walls and engendering much debate within them. The definition problem is one of unsettled meanings that reflect the larger shift in our cities, regions, and nation. This lack of clarity is not our fault. It is merely indicative of a stage of societal transition, but it does make for impossibilities in forming a consensus about the attributes of a good exhibition. Without such a consensus exhibit evaluation is perilous and even contentious.

Although I am not a typical museum visitor because of my profession and experience, my anecdotal observation and personal experience make me conclude that historical exhibitions have only two key elements: original artifacts and design. Interpretive text, other than artifact identification, is of secondary importance. In my experience, exhibitions are a visual, visceral, aural, intellectual, and emotional encountering. Some artifacts make me weepy, others excite me or thrill or astound me. Some touch me deeply: Michael Blassie's, for instance. Michael Blassie was killed in Vietnam. His unidentified remains and a few shreds of clothing and scraps of equipment found in the proximity of his death place were buried in the Tomb of the Unknown Soldier. Subsequently DNA typing positively identified his remains, which with the associated objects were returned to his family in St. Louis. His body was reinterred but the family brought the objects and some family photos of Michael to the Missouri Historical Society where they were included in our new "Seeking St. Louis" exhibition, in a section called "Coming Home." Michael Blassie's story brought back some barely submerged personal memories; I was of age during the Vietnam conflict. Yet his story is also a human tragedy of loss and a story of always-senseless war, a tale of the darker side of our character. But I was unprepared for the arrival of Michael Blassie's family at "Seeking St. Louis" opening day—his mother, siblings, aunts, and uncles. Michael had been dead for more than twenty-five years but his death might have been just the day before that day in February 2000, as I felt immersed into a family tragedy. It was a mourning, a joyful but excruciating remembrance, a public homecoming, something both brand new and ancient. For me this was history museum exhibition at its best.

I remember a poetry class at Carleton College in 1968. We learned how to analyze the construction of poems, how to pull them apart and look at the skeletal material. I did it but when it was done I still did not know why some poems struck my heart and my gut while others were just competent constructions. It may be that exhibit criticism can evaluate whether the exhibition is competently constructed but

What process of exhibition criticism is credible, valid, and useful to all those involved in the development process?

There is little agreement on the definition of excellence.

The credibility of the exhibit depends on direct interaction with objects and the freedom to establish meanings without third party interpretation.

The problem of critiquing exhibitions is daunting, if not impossible.

not whether it is really "good." We can check whether the facts are accurate and sustain conclusions. We can see if labels are literate and readable. We can ascertain if the design is suitable and well crafted. We can judge if the topic is significant. We know whether the audiovisual equipment is functioning. We can even predict if portions of an exhibition will be offensive to some people.

The trouble is that, unlike poets, we are reluctant to assign credibility to feelings. We think that facts should speak for themselves in cool rational terms. We mistrust emotion and evocation as sources of truth. Facts are truth—feelings are not! Yet those who analyze the complex working of our brains say that emotions are what we use to sort facts and that emotion is at the core of human rationality. I think that, at least in some respects, good history exhibits are like good poems. They encourage us to palpably feel the presence and reality of other humans before us, perhaps even to feel things we have never felt before, and to be changed by the experience. This is the power of artifacts, the real and incontrovertible evidence that the past is real. We may debate the meanings of objects, but their most important attribute is simply that they exist. Much as we would like to dictate their meanings to visitors, we cannot. Meanings will vary with the life experiences and emotional constitution of each visitor, much as a poem's meaning varies with every reader. This interaction between object and human is at the core of the museum experience. This interaction is both personal and emotional; hence it is both unpredictable and unmeasurable. If we seek a thesis substantiated by fact, we can find it in a monograph or dissertation. But if we admit to an emotional encounter with the past, we must also acknowledge the power of real objects to evoke empathy, passion, and intuitive understanding.

The debate over the legitimacy of the peculiar and evocative character of history exhibitions is just one symptom of the contemporary shifting of the societal milieu. I have already mentioned the problem of definitions that is also a marker for change. But other evidence abounds. There is an ongoing squabble about the extent of authority over exhibition content exercised by academic experts, museum workers, and community representatives. I have participated in discussions of whether museum workers are simply translators between the academic specialties and the public, or whether museum exhibitions are qualitatively different research processes. I have sat in debates about qualifications of developers, definitions of significance, sharing of authority, involvement of the audience, and the intended experience. The outrage by academic historians over the efforts of some veterans organizations to exert authority over interpretation of an exhibition featuring the Enola Gay is a prominent case in point. This dispute was not about the correctness of one perspective or another but about the conflicting claims of authority over the meaning of an event, in this case the dropping of the atomic bomb. What it revealed was the

chasm between competing interpretations. Who gets to determine the meaning of the past?

But for museums, the other side of the debate is just as perilous. In our recent efforts to develop a partnership exhibit with a Bosnian immigrant community in St. Louis, we have struggled with our institutional responsibility to exhibit content. The intent of the exhibition is to explicate the experience of new immigrants seeking to maintain their identity while simultaneously struggling to adapt and survive in a new nation and alien culture. Yet the story cannot be told without setting the context in Bosnia-Herzogovina, where the story began and where it has been slashed with racial, ethnic, and religious animosity that crosses centuries. In light of recent events, Bosnians are not detached and analytical about the past. But we as an institution must espouse factual accuracy over emotional involvement and admit to the overwhelming complexity of the past. While we have formed a fairly intimate partnership with the Bosnian immigrants, we must maintain an intellectual distance that our visitors will perceive.

No single reviewer will possess the skills to perform a thorough and proficient evaluation of an exhibition.

So what of exhibit criticism? At least in history museums, criticism must involve three perspectives to be credible: quality of research and interpretation, design competence, and visitor experience. In most cases no single reviewer will possess the skills to perform a thorough and proficient evaluation of an exhibition. As a beginning, or a temporary measure of expediency, we might call for three individuals with distinct expertise in those specific fields to critically examine our exhibitions. For the rest, we will learn patience. Society will develop a new synthesis that acknowledges and respects the diversity we have finally recognized and a new set of norms that provide civic identity and social adhesive. But for now we in examining our exhibitions must face a foggy ambiguity and understand that definitions for museums will not evolve more rapidly than society itself. Healthy debate over the definitions, the intent of exhibitions, and the sharing of authority will continue. So exhibit criticism will wade into murky waters, the markers and standards unclear at present. We can, and must, acknowledge the ambiguity, the evolution of intentions, the processes that motivate exhibitions and their development.

Commentary by Nicola Longford

The crux of the argument about who is qualified to provide museum exhibit criticism, and for what audience, is simple. It rests with the museum profession's overwhelming desire for validation amongst its peers, that the museum has "done it right." This level of peer acceptance is at least as important as the success of a "blockbuster" exhibit, which is often measured by volume (streams of people coming through the museum door), increased membership, restaurant and shop sales, high levels of media coverage, and an increased "awareness" within the community.

Critical reviews of museum exhibits in academic journals such as the *Journal of American History* tend to focus on issues of historical content, method, and exhibit layout rather than an exploration of the overall exhibit experience. These reviews also tend to reach select audiences, typically the academic historians who do not necessarily interact with the creators of exhibits. In turn, the creators or the producers of exhibits often do not have access to the academic reviews which can provide useful data for future exhibit development. Reviews of exhibits in other museum or trade journals (*Museum News, Curator, History News*) are often general in scope, with an inclination to remain relatively non-critical.

A growing trend over the last decade within the museum profession is the attempt to gauge the quality of visitor experiences and to find better ways of measuring successes in the exhibit environment. How do we do this, when reviews in museum trade journals and academic history periodicals do not really explore the total exhibit experience and, as Archibald and others have emphasized, where there are no clearly delineated standards or guidelines for critical analysis? Critical reviews for museum professionals are quite different from gathering data from visitor surveys, focus groups, and other forms of visitor feedback. This glaring absence of a practical critical review process within the profession needs to be resolved.

The question still remains, though, who should conduct these reviews for the museum professional? Taking Archibald's suggestion to another level, could the exhibit review process be an integration of critical viewpoints from academics, historians, designers, curators, conservators, exhibit developers, and possibly other museum voices? To provide balance, data from visitor evaluations could also be incorporated into the review mechanism while still acknowledging that the methods for collecting data from visitors are often very controlled methods, which can significantly alter the results or impact of the study. Unwieldy as it initially seems, it can and should be done.

A new museum journal of note, *Museum Practice* (published by the Museums Association in London) addresses multiple facets of museum operations in a practical and realistic manner. Each edition covers universal museum topics and presents several case studies of specific projects, exploring all aspects of a project from delineation of objectives and implementation to project budget and the outcome and feedback and including such details as lists of contractors, consultants, and supplies. While the reviews of projects are not critical from an academic perspective, the goals of the project, and in our case the exhibits, are well defined. For museum theoreticians, *Museum Practice* may not provide great stimulation; but for those charged with the responsibility of actually creating exhibits, this journal is

of eminent value not only for the wide variety of ideas and techniques presented. *Museum Practice* also provides an opportunity to examine elements of projects which worked, failed, or didn't meet expectations. This comprehensive and constructive approach is a novel concept which museum professionals should heed.

As Archibald has already stated, the creation of exhibits is a multi-disciplinary process involving many different facets of the museum. The composition of the exhibit development team is indeed a crucial link to a successful implementation of an exhibit. (The whole concept of an exhibit "team" and its effectiveness is another area of current discussion in the museum field that *Exhibitionist* [Spring 2000] has recently addressed.) Each person involved in the exhibit team process brings different perspectives and areas of subject-matter expertise to the project. Educators, visitor services representatives, exhibit developers, historians, curators, conservators, designers, marketing and development strategists are not necessarily accustomed to working on such teams. However, it has become imperative that in order to create and produce innovative, dynamic, meaningful exhibit experiences for visitors, museums must draw upon the skills of those experts already within the museum walls, while at the same time listening to the voices of the community.

Many museums today would acknowledge that they are going through a period of deep self-evaluation and introspection. The changing paradigm to which Archibald made earlier reference has stimulated internal discussions amongst museum staff. While there has been much rumination in the museum literature about many of these topics, no clearly articulated resolution has been forthcoming. Museum experiences, it is intended, will create opportunities for visitors to explore who they are and to take away a new perspective or understanding of what "we" and "they" are all about. With the right tools provided by the exhibit creators, visitors can construct, deconstruct, and reconstruct their sense of place or own set of meanings. The very concept of history meaning making in the museum exhibit world is just another attempt to increase our understanding and develop our definition of who we are, were, and will become. These are the most elemental of questions and the processes through which we define being human.

There is little argument that history museums, in particular, have been forced to shift from the stuffy traditional offerings of static displays to developing more engaging, interactive exhibits and more educational dynamic programming to better accommodate today's museum visitor. Museums must contend with audiences who have more choices to make about how their precious leisure time is spent. This has inspired exhibit developers and designers to invite members of the local communities to participate in the assessment of what it really is that the visitors want. The notion of shared authority, as Archibald has already noted, is one which history museums will continue to explore and develop. What is acceptable and what is not? Do the new stories, ideas, approaches, and methods of presentation have resonance within a community, and on what levels? The nature of these responses can become some measure of how successful the museum's launching of potentially controversial issues or unconventional non-traditional modes of presentation will be. In the end, does it really "sell"?

Is this attitude an abandonment of rigorous intellectual pursuits? A resounding "no!" The challenge to the museum is really further refinement of the range of stimulating and provocative encounters that can be provided in exhibition spaces and of opportunities of visitor engagement on many different levels. This does not negate the museum professional's adherence to maintaining standards of academic excellence. Subtle situations in the exhibit environment can be deliberately created to add layers of meaning. This can be achieved by careful selection and placement of objects and interactives and by deftly controlling type and level of light, temperature, color, texture, and the numerous other elements that will stimulate and engage all the human senses. Through creative design, these delivery systems for encouraging "experiences" within the exhibit setting can incorporate strategies and techniques which engage visitors with a wide range of interests and backgrounds.

We must speak in generalities because the make-up of museums are just as diverse and complicated as the audiences crossing the threshold. Museums, regardless of their specialty, are the conscious producers of a plethora of emotions and experiences that commence before a visitor enters the building and continue after the exhibit encounter. Of course, many of the experiences museum visitors encounter cannot be controlled or predicted. Museums recognize that their visitors are the ultimate consumers and come from diverse cultural arenas; the different perspectives and levels of knowledge and understanding about identity and each one's place in a complex, living system must be respected. By becoming more effective communicators amongst themselves and with their communities, museums can better encourage visitors to construct their own histories and experiences in multiple ways.

The appealing maxim from the British Broadcasting Company is applicable to museums as well: "Inform - Educate - Entertain - Innovate - Enrich." The museum that abandons any of these elements has failed its community. What more accurate "critical review" could a museum encounter?

Through the Looking Glass

by Marlene Chambers

Marlene Chambers is Director of Publications for the Denver Art Museum.

A critique of "Eyes Wide Open: The Art of Viewing Art," University of Colorado Art Galleries, Boulder, January 20-March 22, 2000

Art museums have been universally slow to respond to the relativistic postmodern concepts of learning and communication that have begun to transform the fundamental nature of exhibition practices elsewhere in the museum world. That's why it's exciting to find an art exhibition that sets out to tackle the challenge of postmodernism head-on. As its title suggests, "Eyes Wide Open: The Art of Viewing Art" offers a rare example of risk-taking in a field that has been too long mired in authoritarian, information-based "truth-giving."

Since the exhibition was mounted as a team project by a graduate seminar in theories of art history at the University of Colorado, Boulder, it's worth a close look as a harbinger of things to come. Though art museums remain notoriously conservative, universities and university art galleries offer scope for sedition and can act as proving grounds for change. Even if the curators-to-be who worked on this exhibition later find that the view from an ivory tower is quite different from the scenery glimpsed at ground level in the midst of a bureaucratic traffic jam, they'll never lose sight of distant possibilities.

Visitors are simply not seeing what the experts are telling them they should see.

Historically, of course, art exhibitions were nothing but a display of art objects widely believed to be able to "speak" for themselves to the "happy few" who were privy to their esoteric mutterings. Little wonder that the information-heavy, didactic approach still dominating art museum exhibit practice came as a hard won, welcome, and seemingly enlightened advance. Even today, almost three decades after other types of museums began experimenting with postmodern models of communication and learning, art museums pride themselves on being educationally advanced because they have filled their galleries with "textbooks on the wall," an often mind-boggling plethora of information designed to speak for the art and to give visitors definitive answers about what it all means.

At its most enlightened, this kind of explication usually aims to "put the art in context," to provide a human connection. For objects created by anonymous and long-dead artists, the connection is made through ethnography and cultural history; in the case of works by artists nearer our own time and place, by art historical and biographical framing. Rarely do these expert interpretations hint at alternative intellectual constructs, much less at entirely different ways to find meaning in the works on view. Sometimes exhibit developers flog a sociological or iconographical interpretation suggested by the most recent archaeological find without even hinting that this view is likely to be modified or overturned altogether by the very next dig or theory. In presenting Western art of the modern era, they sometimes allow irrelevant art historical details, tales of mutant genius, or gossipy biographical tidbits about the artist as a flamboyant and quite weirdly "other" personality to overwhelm the art they supposedly illuminate. Contemporary art, part of the visitor's own familiar cultural milieu, is often overanalyzed to a speedy, if tortured, death that merely distances it beyond recognition. So much for interpretation that enhances our common humanity.

Whether we like it or not, visitors respond to objects and to the exhibition's intellectual frame from always idiosyncratic, though culturally shaped, personal perspectives, and I think this explains the often heard plea for more information. Visitors are simply not seeing what the experts are telling them they should see, and they're struggling to make sense of the discrepancy

between their own interpretations and those of the experts. It is precisely because museum visitors value expert interpretation and at the same time seek validation for their own responses that they believe more information would help bridge the gap between the two. Witness, for example, the Walters Art Gallery's "Gold of the Nomads" exhibition, which came under scrutiny in this year's American Association of Museums critique session and about which so many colleagues voiced this disconnect and called for more and different information.

With "Eyes Wide Open: The Art of Viewing Art," we seem to have stepped through the looking glass into a place where our usual expectations will be turned upside down. The title encourages us to think that here, finally, is an art exhibition that will affirm our own ability to see, one that underscores the act of viewing art as a creative process equivalent to the making of art. But this, we soon learn, is not exactly what the developers had in mind. The long introductory label declares that,

> unlike the standard authoritative voice of most museums' educational labels, the texts herein are intended to empower the viewer to notice and to question his or her responses.

The exhibition, we are told, sets out to look

> critically at the role of the viewer, of the artist, and of the presenting institution. It invites you, as viewers, to examine the ways in which your experience of art is framed—and your responses thus controlled.

We are not merely to respond to the works, it seems, but to think about why we respond as we do. The wording of the invitation suggests that, when we examine our responses in the proper light, we will recognize them as "controlled" by external forces that have determined our mindset, by cultural circumstances beyond our control. We can see clearly, it appears, only when we are fully aware of the blinders we wear. This postmodern twist to the meaning of the exhibition's title acts as the exhibition's own unifying or controlling frame and is reiterated in the label's final sentence:

> As you enjoy these works of art, also watch the process of your looking: see with eyes wide open.

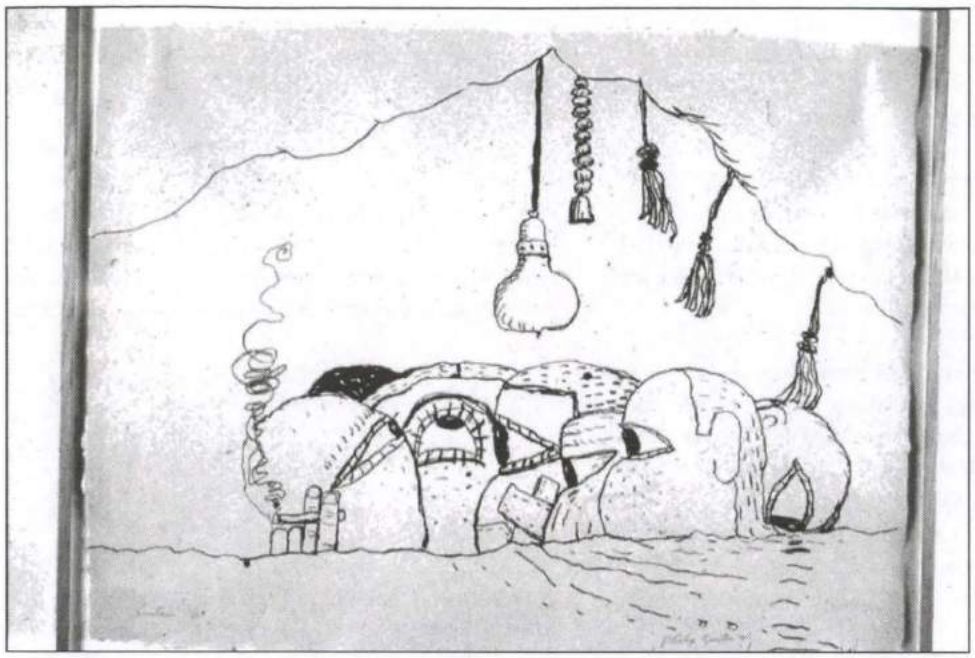
Though the introductory label rambles on for more than four hundred words and is likely to go unread or to receive only a cursory skimming by most visitors, it is full of interesting ideas. It implies, for instance, that the experience of art is a three-way communication between artist, expert interpreter (the presenting institution), and viewer. This must come as a revolutionary and liberating idea to many visitors, who have learned to expect art museums to follow the cultural transmission model of communication, with all knowledge flowing downward from on high like the golden shower of Zeus.

But unless we have our umbrellas handy, we're about to get rained on anyway, for the same introductory label goes on to tell us that, beginning with the Reformation, visual images have been used "as a form of criticism—e.g., as a means of questioning the institutional powers of church and state" or, at the very least, in the case of contemporary art,

We can see clearly only when we are fully aware of the blinders we wear.

as a means of questioning "social norms." This intellectual position, which, as we shall see, shaped both the selection of works for exhibition and the experts' interpretations, is never identified as the lens through which our experts are looking but is presented, instead, as an incontrovertible and immutable principle. By treating their own astigmatism as an art historical fact-of-life, the exhibit developers blur the distinctions that define our vantage point, the artist's, and their own.

The effort to "empower" viewers to look critically at their responses is thus undercut at the outset by the developers' apparent failure to recognize the exhibition's central intellectual paradox: the authoritarian decree that visual images are criticism grounded in specific cultural contexts actually acts as a secondary constricting "frame" that "controls" both their own and visitors' responses. It is not only our personal assimilation of the general cultural attitudes of our time and place that will inevitably guide our responses to the works on view here, but our reactions are to be further constricted by a specific axiom drawn from the culture of today's art history scholarship. By wholeheartedly endorsing social context as the exclusive source of both meaning and meaning making in art, the developers debase and inhibit the viewer's ability to perceive and respond. Set free to "watch the process" of their own looking, visitors are actually ensnared in the intellectual framework of the experts' readings. The same scholarly lens reduces the artist to a ventriloquist's dummy, a mere mouthpiece for the prejudices of his or her particular milieu, as understood and defined by current scholarly hermeneutics. There is no room for individual consciousness in this view of art, no scope for either artist or viewer to seek or find meaning outside the bounds of either tribal consciousness or expert framing. What begins as relativism ends in absolutism. What starts as a promising effort to set viewers free, ends in looking pretty much like entrapment.



Philip Guston, "Curtain," 1980. Colorado Collection, CU Art Galleries, University of Colorado at Boulder: Gift of Polly and Mark Addison. Photo Aaron Hoffman.

Art and the viewing of art, both supremely creative acts, lose significance and authenticity.

The fifteen works or groups of works on paper included in "Eyes Wide Open" have been thoughtfully chosen, and all do, indeed, comment on their subjects. Some are the work of notoriously astringent, even savage, social commentators—William Hogarth, Francisco Goya, Philip Guston, and Robert Longo. All are accompanied by explanatory labels that attempt to supply context and provoke critical thought, always provided these thoughts run along tracks established by the exhibition's framing intellectual constructs.

What starts as promising effort to set viewers free, ends in looking pretty much like entrapment.

Yet, in the context of these frames, what are we to make of Philip Guston's "Curtain," a lithograph dated 1980, the same year in which, as the interpretive object label points out, Guston died? The student who prepared this label rejects the general tendency of critics to interpret Guston's images "in terms of his life" and looks instead for the "multidimensionality of a bigger picture" in this work. Since the exhibition takes the position that visual images question social norms and that our vision and ability to communicate is always rigidly controlled by cultural circumstances, the expert interpreter stretches for a meaning that illustrates these points:

> [Guston's] images . . . address our nasty tendency toward insularity and tunnel vision—the limited perspective available to any individual mind. [His] inflated, one-eyed heads speak of absurdity and pretense. They beg for communication passively-aggressively.

Well, perhaps. And perhaps not. After this scathing indictment of human nature itself, our label writer concludes somewhat mysteriously,

> The visual wit of "Curtain" almost shouts at the viewer—bound and gagged like Guston's cartoon characters—to let the performance begin!

Or end? Insularity, absurdity, pretense, bound, gagged? Surely there is room for alternative readings. What are we actually looking at? A group of heads, most shown in profile, float or bob companionably about in a body of water (though the head at right has turned away and is now submerged up to its eyeballs). Above these heads hang a bare light bulb, the curtain of the title, and four curtain pulls. If something is about to happen here, we might well assume the curtain will be pulled and the performance concluded. As our interpreter suggests in the label's opening paragraph, the "work brings to mind sayings such as 'The final curtain!' and 'It's curtains for you!'" If there is a "bigger picture" implicit in Guston's image, it could just as easily have more to do with mortality as an integral

aspect of the human condition than with our "nasty" human foibles (aside from the "coffin nail" one of the heads holds aloft at left).

In trying to shoehorn "Curtain" into an interpretation that fits both the exhibition's major art historical premise and Guston's reputation as a social and political satirist, our interpreter sends us out of earshot of the artist's own voice in the three-way communication we might have hoped for. A few biographical details might have been more to the point than the psychobabble we are treated to. Both interpreter and visitor could well have profited from knowing that in 1976 Guston, then sixty-three, was hospitalized for exhaustion; in 1977 his wife of forty years suffered a debilitating stroke; and a near-fatal heart attack in 1979 seriously impaired his ability to work. Impending personal death is a huge subject, and surely one that might strike a resonant note in the heart, as well as the mind, of any viewer—regardless of "the limited perspective available to any individual mind."

When we turn to look at "The Beds of Death" etching from Goya's "Disasters of War," we, as well as the interpreter, are on firmer ground. Our label writer reminds us that Madrid was devastated during the French occupation (1808-14), when atrocities were committed by "oppressor and oppressed alike" and "Spaniards perished in such great numbers that graves could not be dug." This is all we need to know in order to understand and respond to Goya's stark, unindividuated image, in which both mourner and victims are shown as little more than lumps of humanity. Yet, here too, with less reason, we are led astray by an intruding interpreter, who concludes by asking, as if the question could be answered or even mattered, "Is the old woman who wanders past the corpses looking for a loved one among the victims or destined to join their fate?" The universal nature of the image transcends the specific and documentary, just as it resonates beyond mere criticism of institutional power. The etching's power lies in its ability to inspire personal meditation and memory. The weight of the old woman's shrouded grief bows us all.

Other interpretive labels carry on in this vein, with greater or lesser sensitivity to artist and viewer. Only occasionally, when a label writer points out the obvious gulf that separates us from the original viewers of one of the exhibition's historical works, are we reminded of our main business in this exhibition: to put ourselves under the microscope. Overwhelmingly, the texts that were "intended to empower" viewers to "notice and question [their] responses," concentrate instead on explicating the works in accordance with the exhibition's framing art historical dogma: "the use of visual images as a form of criticism."

In terms of its ability to shed light on the way we could go about achieving the exhibition's professed aim of understanding how our responses are framed, one of the most successful labels accompanies a turn-of-the-twentieth-century album of prints assembled by an unknown collector or series of collectors. Our expert interpreter draws attention to the album's unequal division of subjects between "us" (with Stonehenge, that sophisticated symbol of the rise of Western civilization, getting detailed treatment)

The experience of art is a three-way communication between artist, expert interpreter and viewer.

Francisco Goya y Lucientes (1746-1828), "The Beds of Death" (Las Camas de la Muerte). Colorado Collection, CU Art Galleries, University of Colorado at Boulder: Gift of Anna C. Hoyt. Photo Aaron Hoffman.

and "them" ("boiled down to a few palm trees and other picturesque subjects") and concludes that this "ethnocentrism . . . probably was not as obvious to [the album's] maker(s) as it is to us." Undoubtedly, but just in case we miss the point, our interpreter asks, "Are our seemingly innocent contemporary 'pastimes' (e.g. video games) similarly conveyances of ideologies that we would rather not claim, if we were able to recognize the biases of our 'stuff'?" Well, if we're not able to recognize these biases, what are we supposed to be doing here in this exquisitely framed exhibition?

In the end, language defeats the admirable aim of this exhibition to set the visitor free to look with eyes wide open.

Perhaps the exhibition developers simply undertook too much, asked themselves and visitors to do too much at once. Suggesting that the experience of making meaning of art is like a three-way conversation in which visitors, artists, and experts all play a role is an immense gift, but not when the expert voice drowns out artist and visitor alike. Asking visitors to search out "differences among artworks made for various contexts" and to look for the "subtle ways in which images conspire with personal and cultural memory" may well open eyes to possibilities never before glimpsed— but not unless there is some illustration of how this exercise can be carried out, some effort to demonstrate how these complex moves are made. And, finally, some visitors may find it difficult to respond to the art at all if they are busy trying to take advantage of the introductory label's invitation to look for the ways in which their "experience of art is framed—and [their] responses controlled." With one eye glued to a microscope, they might naturally feel a little handicapped. I find myself thinking not of art but of physicist Werner Heisenberg's uncertainty principle and the impossibility of taking certain kinds of measurements. If we're focused entirely on looking at ourselves in the glass, we'll never get past the interpretive mirror and into the world of imagination and memory.

In the end, it is language, even more than the desire to do too much at once, that defeats the admirable aim of this exhibition to set the visitor free to look with eyes wide open. We are caught, like Alice, in someone's dream, and it matters tremendously whether it is our own or the Red King's. The jabberwocky superimposed on unique artistic voices by the rigid interpretive frame leaves visitors deaf and mute, their vision impaired by a lens that is always a little out of focus. This is a shame, a wonderful opportunity missed, an important message garbled.

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Science City— Is It a New Adventure?

by Patricia Simmons

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A critique of the Science City museum in Kansas City.

"A museum experience is supposed to be intensely private and personally transforming" (Karp, Kreamer, & Lavine, 1992: 12).

"Mom!!! My hand looks like one of those monster movies! The skin is crawling!"

So begins one young boy's visit to the Myster E. Hotel exhibit at Science City—one of the newest mergings of a science center, theme park, theater, adventure, and discovery for individuals of all ages. Located in the newly renovated Kansas City Union Station, the 60,000 square foot Science City museum allows visitors to stroll among streets and city areas that contain various science-based themes and a 440-seat 3-D theater with a five story screen.

On a busy midweek June day, I visited the new Science City complex, eagerly anticipating an experience combining the renovation of a treasured and historic landmark with the "latest" interactive science exhibits. Having read about Science City in the *National Science Teachers Association Reports* (December 1999) and the *Kansas City Star* Special Commemorative issue (Fall 1999), I remembered the emphasis on Science City's motto, "A New Adventure Every Time", and the promise of over fifty interactive science exhibits. It is within the roles of "museum visitor" (having visited many of the major science museums here in the U.S., Europe, and the Pacific Rim nations), "science teacher" (having taught secondary science in public schools in the U. S.), and "science educator" (currently at an institution of higher education and a science cultural institution) that I embarked on the adventure promised by Science City. I began my experience with two framing questions around which my interaction with exhibits and observations of other visitors would occur:

1) How does Science City portray the nature of science and the nature of technology?
2) Does Science City represent "Entertainment" or "Education" in Science?

Museums must provide learning experiences that extend beyond a traditional acceptance of authority.

A museum can be viewed as an agent of social justice and education that is striving for consensus and struggling with conflicting ideas and processes. Karp, Kreamer, and Lavine (1992: 1) stated that museums have the "power to represent structures of belief and experience through which cultural differences are understood". Different museums display these experiences through different expressions of power, art museums through visual experience and natural history museums through narrative experience. A science museum displays the power of science and technology through visual, narrative, and, most popularly today, hands-on experiences. With hands-on experiences, however, must come the transformation to "minds-on" experiences, where visitors are engaged not only physically, but more importantly, cognitively at higher levels of awareness and understanding. Museums must provide visitors with

learning experiences that extend beyond a traditional acceptance of experts or authority reinforcing a rhetoric of conclusions. The challenge with transforming the hands-on exhibit to a minds-on exhibit is to engage the visitor in the creative, exploratory nature of scientific inquiry, not simply repeating known outcomes over and over. In serving as a predominant means for the cultural transmission of the nature of science and technology, science museums are in a pivotal position of cultural power. They must examine all facets of science and technology in order to serve the mission of promoting an understanding of science and furthering scientific and technological literacy for all.

As cultural institutions carry out their respective missions, they select and decide what kinds of pedagogical approaches work best. Hein (1998) and Hein and Alexander (1998) discussed the kinds of pedagogic approaches present in museum education for visitors: expository-didactic, stimulus-response, discovery, and constructivism. Discovery pedagogy can be exemplified as interactive exhibits that enable visitors to challenge themselves and develop new understandings, with many of the outcomes serving as replications of famous experiments. These kinds of exhibits allow visitors to move between exhibits, revisit them, and accommodate a variety of learning modalities. Constructivist pedagogy in museums plans for unanticipated outcomes, and builds on the premise that visitors bring their unique learning backgrounds with them to rebuild or construct new meanings about phenomena or ideas. Many exhibits provide opportunities for visitors to make connections about concepts through activities that build upon their previous experiences. There may be no set "right or wrong" answers in how visitors solve a sample problem. Social interaction is also important in negotiating with others as all involved are making meaning or changing their understanding of specific concepts or problems.

Overview of Science City

The first impression of Science City impacts visitors with the vastness of the Union Station facility—the textures, sounds, brightness, and color of the original train station and the glass and steel addition of Science City. Upon entering the Union Station complex and the Festival Plaza to Science City, visitors encounter an interactive water fountain where numerous streams of water appear to defy gravity by flowing uphill to the second and third tier of the fountain. Children dash into the center of the first tier, where an electric eye halts the flow of water upward to allow passage, then reestablishes its flow—creating a child behind bars of water effect. The overall effect piques interest and raises the expectation that Science City will not stand as "just one more static science museum."

This welcome sign greeted visitors who passed the threshold for adventure:

WELCOME TO SCIENCE CITY!
1. Have Fun!
2. Explore: There is no right or wrong way
3. Discover: Science is everywhere.

Two questions were raised by this welcome sign: What is meant by "discover"? How does the concept of "discover" link to "science is everywhere"? "Discovery" has come to serve as a synonym for "real science" in many formal and informal educational settings. Because this term serves many different meanings in science education, its usage bears examination, especially when "discovery" is used to communicate what "science" is to the variety of visitors who attend science museums, theme parks, and other cultural institutions. To answer these questions, I proceeded through the parts of Science City, looking for linkages of "science being everywhere." I initiated my adventure by examining individual exhibits and groupings of exhibits, engaging in the activities, and observing various age groups and family/school groups interact at selected exhibits.

An Odyssey through the Exhibits

Science City is organized into city districts marked Downtown, Uptown, Southside, and Old Town. A visitors center desk and a Travel Agency are housed on either side of the entrance, a bit off-center from the flow of visitors. The first exhibit noticed by all visitors was the beginning of Uptown, a Music Park where notes and tones can be sampled. Children of all ages and a few adults played notes by stepping on piano octave keys on the floor, passing their hands over the light-activated tone pipes hidden in gravel, or banging on the trashcan drum set. Completing the Music Park led visitors to the Space Place and the Astronaut Training Center. This exhibit encouraged visitors to select a training level and to follow a series of posters describing global ice and sea level changes, volcanoes, ocean processes, and ozone depletion. In all of the examples of remote sensing, only one poster on ocean processes mentioned the term remote sensing. Proceeding through the Training Center, visitors were asked to prepare for their mission to Mars. They encountered lockers with clothing items, testing of rock samples and a rover (several exhibits were not functioning), a dizziness challenge and cardiovascular fitness test (bicycle with no heart monitor), a compatibility test, a sample crew (with sleeping bags) and a space lab quarters (hydroponic facilities). Unfortunately, visitors would not be aware of the nature and function of many items, since there were no explanations nor diagrams highlighting important concepts or technology linked with space travel. For example, one pod with components of old computer cards arranged within a circular see-through container was not linked to any of the other pods illustrating hydroponics, life support, or other control systems. An earth monitor computer simu-

lation with a problem solving scenario (locating a downed plane) looked promising, but lacked sufficient background information in the program for the problem to be solved.

Uptown

Myster E. Hotel focussed on unusual occurrences at the hotel, which could be deduced through the laws of physics. Several popular exhibits engaged visitors with optical illusions (spinning black and white wheel, portraits with frowns or smiles upside down, and the skull/couple illusion), distortion of proportion and location in space (a guide directed visitors to lie down and look at optical miscues that led to the sensation of falling forward while lying flat on the bed). Explanations were provided with the optical illusions exhibits in the hotel. Other props in the hotel included stairs to nowhere, a phrenology skull on a Victorian style desk, and a clock turned upside down and backwards, all designed to contribute to the theme of strange occurrences in science that could be explained through examining one's perception of reality.

The Crime Lab allowed visitors to select a case file with fingerprints, fibers, crime scene description, and hair sample as they entered the office of a police detective. This series of activities proved very popular with visitors of all ages, allowing children and adults to participate together in solving the crime. Science City staff at a computer station with a sketch artist program provided sample portraits. Another setup allowed visitors to examine their own fingerprints and compare them to the suspect's fingerprints. In addition, hair sample scans and handwriting analyses provided information for visitors to use.

The Severe Storm Center channeled visitors to a three-console desk with wall monitors depicting an upcoming storm and a TV news team covering the anticipated storm. The Vortech console divided visitors into teams, and provided information on a simulated weather problem by monitoring a storm cell. The video provided information by the chaser team. However, the weather stations did not permit children or adults to manipulate any variables or interact with the other teams or the TV weather team. A booklet on tornadoes was at each station, but did not appear linked to any video or computer activities. Visitors sat at the consoles but were unclear about how to proceed, since no directions were provided.

Art in the Park began with a pinball machine leading visitors to a fountain in a park-like setting, where they found a wishing well with smoke emanating from it, a spinning slotted wheel through which an animated figure appears, a relief structure (visitors created their own portrait by pushing pins in or out), a wave demonstration, an optical illusion (bird and cage illustrations merge into one image when visitors spin the separate images), and Newton's bouncing balls demonstration. Pop Wheelie's Delivery Service (a center-of-gravity bicycle on a steel cable) was the most popular of all exhibits—especially with children, who rode the bicycle suspended thirty feet in the air. Unfortunately, no explanations or discussion occurred to help children and adults understand the physics underlying this extremely popular activity.

Southside

Crossing to this part of Science City, a simulated suspension bridge and mesh bridge led visitors past the Einstein Towers (not open) to the Tree House Nature Center. This exhibit mimicked a tree house, where children used microphone dishes to locate animals by the noises they made and matched

sonograms on the computer with appropriate noise patterns. Books on featured birds and insects were open for display on a desk, which also contained preserved specimens of butterflies, insects, feathers, owl pellets, flowers, and exotic pests. On the lower level was the Nature Center Butterfly Farm, where visitors strolled through habitats with six species of butterflies in various stages of their life cycles. A staff member escorted small groups through the house and was available for questions and answers about butterflies. Adjacent to the Butterfly Farm was the Farm Coop, where children eagerly climbed into the simulated combine to play with the controls. A well constructed computer program

prepped the children for the simulated combine, while older children and adults used satellite imagery to solve the problem about what types of crops to select and where to plant for maximum crop yield. Adjoining the Farm Coop exhibit was the very popular mini-golf course, with a Bernoulli's-principle apparatus (featuring a large beach ball) in the middle of the course. On the other side of Butterfly Farm were the Dinosaur Films, Ltd. exhibits, where many young children spent their time finding and digging simulated dinosaur bones. Visitors could assemble foam jigsaw puzzle dinosaurs, stroll through a recreated Cretaceous landscape (audio and selected videos with information on dinosaurs), view a Dinosaur roundup and Video Digsite (a video of fossilization), and use a computer program to assemble a jigsaw puzzle of dinosaurs (very popular with older children, especially females).

A maze painted on the floor in the middle of Uptown and Southside was a highly attractive site for children. They consistently walked the pathways of the maze, usually accompanied by an adult, before proceeding to other exhibits. The maze also served as the convening point for periodic Science City Demonstration shows.

Downtown

This section of Science City featured human health and physiology and the inner workings of a city's water and power systems. The Science City Public Works area illustrated the subterranean world of a city. Featured were exhibits about power grids, electrical panels, air pressure, elevator, and water works. On the electrical panel, visitors were asked to construct a sentence using words with specific wattage. When the visitor was successful and did not exceed the power limit, the lighted sentence appeared on a wall panel, even though the sentence was not grammatically correct. One of the most popular exhibits with children was the plastic pipe slide, simulating the path which water takes as it is routed from one part of the city to another part. A life-sized replica of a crocodile marked the beginning of the water works exhibit. The plumbing exhibit demonstrated the flush toilet. The pneumatic system contained very effective demonstrations. However, there was little if any explanation to accompany the working exhibits. Another popular exhibit with adults and children illustrated the use of double pulleys in lifting loads, where adults or children sat in a swinging basket and lifted themselves a few feet above the floor.

Visitors of all ages engaged in the activities in the human body works. A staff member guided visitors through the Body Tours (Medical Imaging) of the circulatory system and featured video of what can occur when a patient has a particular heart disease. By walking through the life-sized replica of the heart and blood vessels (with pulsating walls), the stage was set for the correction of this life-threatening situation affecting a 61 year-old male with chest pain. In this operating theater, visitors viewed a mannequin outfitted as a patient and surrounded by medical equipment and peered into the open chest area to watch an actual video of open-heart surgery. The surgeon described the procedure as visitors viewed and listened to the workings of the various cardiac monitors and machines, all of course culminating in a successful operation. Exiting this exhibit, visitors proceeded to Dr. Hale N. Hearty's Family Clinic, where they engaged in standard simple physiology tests. These tests included: hearing, sight, blood pressure, heart rate (audio not distinguishable), reaction time, appearance of skin, balance, occupational stress (computer printouts of sample professions), and sports injuries. Posters and plastic models of organs and organ systems were provided at most stations so visitors could examine organs in detail. The eye was featured in a large walk-in model; however, there was no explanation about what various parts represented or how the iris or pupil functioned (visitors peered through the pupil and saw distorted images). Lab coats were provided to children if they wished to mimic a medical professional.

The most inquiry-based series of exhibits was found in the SOAR Laboratories section (Scientific Opportunities in Applied Research). Visitors found interactive exhibits along with several posters explaining A Century of Physics (Curie, Thompson, and other physicists) and one poster featuring women and flight. The first exhibit demonstrated a comparison among different kinds of balls dropped from towers of the same height, where visitors were asked to predict and test what happens, while a camera offered an enlarged view. Only one of the two towers was functioning. A poster explaining microgravity and NASA's drop tower was placed on a side wall. Both adults and children attempted to engage this exhibit. The second exhibit featured computers with a car design program (especially appealing to teen females), where visitors controlled the body design, tires, engine type, and other variables to build their dream car. As they selected variables, the program sent messages about environmental impacts of a particular design or engine, so the builder could change options. The third exhibit focused on rocket launches and allowed visitors to vary the hydrogen/oxygen mixture of the fuel and follow the effects on the launching of the rocket. This exhibit was very attractive to young boys, who often punched the launch button during the activity and tended to disregard how to effectively launch the foam rocket. Several times, adults intervened but did not explain what to do. Another exhibit featured a wind tunnel, where visitors inserted a large wooden banana or apple and observed the effects of the wind. The last exhibit—robotics—was very popular with males, especially 9-12 year olds and adults. A large table with a variety of Lego parts, engines, batteries, and wires provided the context for designing and testing a robot to search beyond the reach of humans. One young boy busily assembled and tested his

robot (similar to the lunar rover), explaining to onlookers what was occurring. As he interacted with others, his friends immediately joined him, bringing a variety of parts for him to consider in modifying his robot.

Old Town

This series of exhibits was constructed around the theme of everyday life from 1868 to 1964.Visitors entered Old Town via a 1950's gas station with photos and a classic turquoise 1955 Ford complete with music of the time. The gas station set contained details such as an old Coca-Cola machine and other icons. Grandma's Boarding House was the site for visitors to search through the attic and rooms to find a secret passage, a working Victrola, a stereoscope with pictures, a foot-treadle-powered sewing machine, and a wardrobe through which visitors disappeared into thin air. The Kansas City Railroad Terminal (1947), the Barber Shop (1908), the Jones Store—latest fashions (1940), the Adami Hardware Store (1868), and the Appliance Store (1964) were among attractions for visitors to view. A covered wagon and a mural depicting buffalo and prairie habitat were located in the stairwell. Among the more interactive exhibits in Old Town were the Telephone Office (1930) and the Architect's Office (1915). In the Telephone Office, visitors inserted the phone plugs into receptacles on the old switchboard and listened to pre-recorded conversations. In the Architect's Office, test models of the latest building designs allowed visitors to assemble and disassemble wooden models.

Overall, the facilities were comfortable and well maintained. The majority of interactive exhibits functioned well and provided visitors with access and opportunity to complete activities. In addition, the Periodic Table Cafe provided a welcome respite, clean rest rooms, and areas for relaxing and reflecting between exhibits. In some exhibit areas, however, individuals with physical disabilities would have difficulty with unexpected changes in floor level or steps, lighting, or width of passageways. There were no apparent accommodations for sight or hearing impaired visitors (i.e. Braille text) which would allow them to participate fully in all exhibits and activities.

Reflections on Science City

How does Science City portray the nature of science and the nature of technology?

The general portrayal of the nature of science and technology by Science City was consistent with the term "discovery," where exhibits are hands-on and appeal to a variety of visitors. When examining the principles upon which science is founded, some exhibits in Science City were exemplary, while other exhibits communicated different messages.

Exhibits are hands-on and appeal to a variety of visitors.

Science is characterized as the systematic gathering of information through direct and indirect observations, resulting in the production of scientific knowledge about the natural world (American Association for the Advancement of Science 1993; Ferre 1988; Hatton and Plouffe 1993; and McComas 1998). As new evidence arises and new interpretations are made, older ideas are modified or replaced entirely by newer ideas. Among the principles underlying the nature of science are:

1. Scientific knowledge is reliable and tentative.

2. The complexity of engaging in science usually results in shared values and perspectives that characterize a scientific approach (rather than a universal, step-by-step method).

3. Creativity is an integral part of science and the production of knowledge.

4. The primary goal of science is the formulation of theories and laws that are consistent with the best available evidence, tested successfully against a range of phenomena, and exhibit broad applications in further research.

5. Contributions to science are made by individuals across the globe.

6. The enterprise of science is influenced by current knowledge, experiences and expectations and the sociocultural milieu in which scientists and observers exist.

Technology is often an application of science resulting in

some type of product. Since we live in what has been termed a *technosphere* (a place where all individuals' lives are influenced by technology of some form), an understanding and portrayal of the nature of technology is necessary for understanding science. Both science and technology embody questions of values reflected by society.

Visitors learned about the first principle (scientific knowledge is reliable and tentative) through didactic simulations (walk-through circulatory system/operating theater, weather center) or by completing pre-scripted exercises (physiology activities, optical illusions). The overall message presented scientific concepts as explanations, reinforcing a simplistic view of science.

The second principle (a scientific approach is the result of shared values and perspectives) was not addressed explicitly in many exhibits. Visitors completed activities, which were cook-book style exercises following a step-by-step format, rather than a scientific approach in which qualitative and quantitative methods are employed to solve a problem. The Crime Lab series, although conceptually well organized and popular, fits this category. The Robotics exhibit (constructing a rover) came closer in addressing this principle, although many visitors employed a 'trial and error' approach.

The overall message reinforced a simplistic view of science.

The principle of scientific creativity was best demonstrated in the SOAR exhibits, where visitors designed a technological product. It is interesting to note that minimal instructions were provided, yet visitors had little difficulty in completing the tasks. The only exhibit where visitors tested their product was the Lego construction of the rover; the car design program terminated when visitors completed their selections of car design features.

The formulation of theories and laws was among the least addressed principle. Current theories or laws about earth science, geology, and space sciences were mentioned on posters. Although many exhibits were constructed to illustrate selected scientific laws, visitors could simply press a button or engage in an activity with a superficial understanding about the principle. Several exhibits provided ideal situations for visitors to learn about laws (e.g. Pop Wheelie's bicycle on a steel cable) and were missed opportunities for "minds on" science. No signage, activity sheets/guides, or staff were available to assist visitors with their understanding or to provide questions, explanations, or resources for helping them to understand their experiences. One notable exception was the Science Demonstration conducted by the Science City staff. These interactive sessions were very well designed and implemented, and involved visitors with making observations, predictions, and testing out their predictions, all in the context of selected laws of science.

Global contributions to science were found only on posters describing the contributions of scientists in the SOAR exhibits.

The influence of current knowledge, experiences, and expectations was represented in some exhibits, such as the Dinosaur excavation and videotapes of prehistoric life.

The concept of technology as an application of science was ubiquitous in Science City. As mentioned, the SOAR activities focused on the design of a technological product as the outcome for scientific inquiry. This idea was also exemplified by the inner workings of a city, where visitors pushed buttons, hoisted themselves a few feet above the floor, watched a model of a toilet tank flush, or slid down a plastic pipe simulating water flow. Unfortunately, many exhibits offered few if any questions to stimulate thinking beyond "what is this for?" Visitors pushed buttons without spending any time discussing or engaging in meaningful conversations about science principles or technological applications.

One of the most important aspects of science and technology relates to the issue of values embedded within scientific knowledge and the technological ramifications. Science City contained numerous exhibits that would have provided unique and innovative opportunities for raising ethical issues. However, there was little evidence of raising visitors' awareness or questions on ethical aspects of science and technology. In the Old Town area where exhibits contained original materials and equipment indicating advancements in technology, a "sanitized" version (sans critical historical events) was offered to visitors. Although Old Town was thematically well done and included some very interesting props, visitors were hard pressed to link Old Town with the rest of Science City. Old Town would have been an excellent venue for developing questions about technology and the implications of technology across time. Instead, visitors were left to try to make conceptual connections among the Old Town exhibits and the rest of Science City.

Does Science City Represent "Entertainment" or "Education" in Science?

Reviewing individual exhibits, exhibits as groupings around a common theme, and exhibits as series of representations of parts of a city led me to conclude Science City delivered on its promise of a new adventure, but also raised a number of issues about its mission and the messages communicated by a cultural institution to the public. I do not wish to leave readers with the impression of Science City as simply a series of "golly gee!" exhibits more indicative of a theme park. As promised, Science City provided more than fifty interactive exhibits, ranging from display cases of artifacts and posters to "push the button and see what happens" to mini-experiments which challenged visitor's creativity. Individual exhibits were predominantly traditional, hands-on interactive experiences, where visitors could affirm,

reinforce, or discover an idea. Groupings of exhibits (Myster E. Hotel) were based around common themes; however, the placement of some exhibits (the Bernoulli apparatus in the golf course) conflicted conceptually and aesthetically with the surroundings. At times, these incongruities detracted from the established theme (perhaps usable floor space led to limitations).

Visitors ranging in age from preschoolers to senior citizens appeared to enjoy their encounters with the exhibits and with each other. Younger children tended toward the flashier, instant-results exhibits, or ones which they considered playground equipment, while older children spent more time with adults or peers on themes focused on the human body (crime lab, physiology activities). Teens tended to walk quickly through exhibits which appealed to younger children, but focused on entertainment style or tech-based exhibits. Adults accompanying family or school groups usually interacted with their group members at most exhibits, engaging in the activity separately at first or leading the group through the activity. Rarely, however, did the adults or children initiate questions with the other group members to stimulate thinking about their observations and inferences.

The welcome sign posted at the beginning of Science City stated that fun and exploration awaited those who entered. It was very evident that visitors enjoyed themselves and explored Science City exhibits. The hint on the welcome sign that "there is no right or wrong way" to explore sets a context where "the right answer" is not an intended outcome. This message, however, is like a double-edged sword: visitors may leave with a perception that there are no right or wrong ways of engaging in science or that there are no right or wrong answers in science. Many educators and researchers have documented the difficulties precollege students and adults exhibit about understanding what "science" is and what "science and technology" can or cannot do. These perceptions of science can leave our public with inaccurate portrayals of the nature of science. If one of our goals in education is to foster exploration and creative thinking as integral attributes of science, places such as Science City must also provide contexts where exploration and creative thinking can be implemented.

Although visitors explored Science City and the exhibits, the context provided was like a smorgasbord with few labels and many kinds of food items ranging in nutritive value. If we really wish to understand the ingredients, the interactions among them and the thinking of the chefs who sought out and brought the ingredients together, we must go beyond a random walk through science via the "hands-on" experience. Rather than promoting the message that science and technology are like smorgasbords where visitors can "sample" activities that represent and communicate simplistic, mechanical, de-contextualized portrayals of science and technology, we must provide settings for learning that result in more challenging, insightful, and richer understandings of the role of science and technology in our society. If visitors enter and leave an institution with questions that challenge their view of science and technology and with questions that they would not have raised otherwise, then a cultural institution serves as a transforming agent.

Science Center excelled in offering visitors opportunities to sample a smorgasbord of science and technology. Being a merger of science museum and theme park, perhaps these concerns are not intended as part of the mission of Science City. However, cultural institutions by their very nature serve as expressions of the power of disciplines—in this case science and technology. Institutions cannot ignore the ethical implications of what they choose to represent in their exhibits or in our society. As cultural institutions seek to provide enjoyment, understanding, and raise the level of consciousness in learning for a wide variety of visitors, they must balance and respect politics, market-driven demands, multiple perspectives, and challenging issues while raising our ability to ask questions about science and technology and the transforming role for cultural institutions in our society.

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Wait a Minute!

by James Sims

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A critique of "On Time," a permanent exhibition at the National Museum of American History, Smithsonian Institution

"Wait a minute!"

The plaque on the wall called to me, and I did. I was in a waiting room with empty chairs. I had just wandered through a pleasant room with jaunty colors and the feeling of interesting things just out of sight. Open, waiting, I was ready to *transact,* maybe even *make meaning* with the corporate entity which surrounded me: the Museum, the Institution. "What other kinds of time are important to you?" it said.

"What *other* kinds of time? What can you mean? Are there kinds of time? Have we just explored *kinds* of time? Have I missed something?" I said to the entity, somewhat unsettled.

I sat down in the clever, voguish, empty, red chairs, but there was no answer.

Instead, ahead I could see a special display of Mickey Mouse watches in the Time Zone. My adventure in time, "On Time," had arrived at Mickey thumbing his nose at time.

Expectations

Before I set out to see this exhibition, new in this millennial year, I gathered thoughts of time about me, as a climber might check out his tools and attach them to his body before setting out up the mountain. I had thought about *how* time might mean, for me, in my life. I hadn't thought there were *kinds* of time. I went looking for time, or at least a working definition of time in American life. I was looking for pieces of American time: eons, ages, centuries, generations, "When in the course of human events," decades, "four-score and seven years ago," seasons, semesters, months, fortnights, weeks, days, nightshifts, coffeebreaks, happy hours, minutes, seconds: *nanoseconds.* I was primed, with Walt Whitman,

> To think of time—and all that retrospection
> To think of to-day, and the ages continued henceforward.

Time is a river, I hummed, and time=immersion. If we are, we are in it; it is us. Maybe in this experience economy I'll find an immersive environment? I wondered about time as an artifact, presented in a museum setting: elusive and yet somehow, in our cultural construction of it, substantial, like space: how might they "show" it?

I was ready to transact, maybe even make meaning.

Maybe, in a museum of social and cultural history, we might encounter time as a medium of exchange, a commodity: how do you earn it? how do you spend it? In a history museum I might find time arm-in-arm with memory: real, renewed, recreated at will.

I thought about time passing: with speed, slowness, waiting, expectancy, surprise. In the performance of our daily lives, we use the idea of time to structure meaning: we move, think, and communicate

in tempo, rhythm, starts, pauses, and stops. Maybe we'll have Arthur Murray steps on the floor, a dance of time? Syncopated history?

Time is also a judgment: eternity or not? Important or trivial?

I had also seen the *Exhibitionist* article this past spring about the salutary effects of true collaboration in exhibition-making during the making of this exhibition. I was eager to see how an improved process might be experienced in a new sort of public synthesis.

Richard Strauss, Smithsonian Institution

What I got when I arrived was a pleasant, conventional, open room with lots of things in cases, brightly colored graphics, and people wandering down the middle of the room. The room was somewhat brighter than most in this museum, the words of a good height, easy to read. So much for Arthur Murray. Or judgment. Or a new synthesis.

The setting

The *Time* portal opens between two great objects in the National Museum of American History. You walk past the terrific dragster on the rakish angle—an avatar of speedy time, audience caught in a serial blur behind it—Don Garlits' "Swamp Rat," the 1986 Hot Rod World Champion. At the end of the hall—framed in a woodland landscape yet still unsafe at any speed—is the "John Bull," the oldest surviving locomotive, built in 1831. These are great, visually exciting landmarks of technological invention, transforming meanings of time and space.

How does *Time* signal itself here? Not with another great object. Instead, we get a made-up contraption, an artist's conceit of a clock, a sort of wacky automaton: a cute cutout cartoon executive with numbers and arrows, wheels and gears, telling?—or being told?—time. He appears harried, but at one with time. "Time is us," I think. But so long, river. Hello, wacky.

What's that horse doing here?

Surrounding this fictive figure is a text-rail, with text-rail riddles:

"How do you tell time?"
"Can you ignore the clock?"
"What role does the clock play in your life?"
"Who controls your time?"
"Do you have enough time?"

There are no answers here. Perhaps I'll find some on my journey through *Time,* I tell myself.

Beyond wacky, authority asserts itself: just after the automaton is the conventional main label. And another question:

"Why is the clock so important?"

Again, there is no answer. Perhaps we'll be transacting meaning through the inquiry method? But wait: there is a subsidiary statement:

> "When we think about time, we mostly think of the clock. Many of us tend to overlook other ways we experience time everyday . . ."

Ah, hello river: our *experience* of time, our immersion in it, will be the substance of this public encounter. It's not about clocks, people becoming clocks, automata on the run. It's about time after all. Remembering the old hall of clocks that this exhibition replaced, I experience a *frisson* of nostalgia for dials and cases, cranks and faces.

The experience

"What's that horse doing here?"

Geared for immersion in time, ready to enter the exhibition, I leave the wacky man with gears for guts behind. But, whoa! What's ahead? A horse's head? No: a horse, or the stark white skeleton of one. Ah: Judgment, after all. Here inside the exhibition gallery is the powerful object, elevated above our heads, looming over the whole room, a sentinel of Time. I'm ready: tell me why you're here.

Once the structure is apparent, it is relentless.

But there's no label on the big, round, blank medallion under its spectral belly. Puzzled, I begin my search for clues, and stumble into the dark closet to my right. Clocks! A dozen of them, ticking silently in the dark. How wonderful: I get to see some faces after all. Forget the river, it's really about clocks after all. Then why are they in the dark?

What's the text here?
"Revolution!"

This exciting word, in a corner, in the dark, starts my journey through *Time.* It is followed by the standard phrases about the Industrial Revolution and the making of more kinds of goods available for more people, perhaps as a way of excusing the massing of so many delightful clocks. But the multiple-meaning potential in the word *revolution*—sun movement, time marking, gear motion, social change—is not explored here. Or, I discover later, anywhere else in the exhibition.

From the closet of clocks I find my way back around the skeleton and find the actual label for the mystery horse:

> "The Race is On"
> skeleton of Lexington, d.1875
> stop watch, American Watch Company, Waltham, Massachusetts, 1859

The horse was timed by a watch like this in 1855 when it (the horse) ran very fast. But the horse was a horse, running: all stretch and sinew, the sort of mystery of motion which Muybridge captured in his photographic studies. What we have here is the upright assemblage of the horse's bones. Standing very still. This is not an artifact of speed, but it is certainly an artifact of time, a curiosity: the horse ran, the horse died, but we have his bones. There is no irony in the label.

On the other side of the big, round, blank medallion under Lexington's belly, another mystery is solved: this form houses the interactive computer stations in each section of the exhibition.

At the horse's mouth I'm in the mainstream of the exhibition, and find signs of intellectual organization in the exhibition, an organization which is not apparent in the massed forms, the layered images and artifacts. Wandering down the middle of this small gallery I can see at a glance that I was supposed to follow a chronology of chronos, zigzagging from side to side, front to back: a great hall of gerunds doing things to, for, and in time: marking, mechanizing, synchronizing, saving, and expanding.

If time is a river, each of these sections might be a bayou in the river, a pleasant, inviting eddy of exploration and reflection. Beyond the horse the horizon is constant. The powdery sky-blue walls hang like a cyclorama in need of a good lighting designer. I'm not hurried along by exciting visual rhythms. Nor am I arrested by important visions along the way: there's not much to look at along the shore. There are lots of objects in a casual array of cases lined up next to each other, a collection of miscellaneous goods pretty much like other display lineups in this museum. There are clever text stands, easily adjustable in response to audience research, with easily replaceable small panels at a good, readable height; unfortunately, they look like pages from a book.

At passages from one section to another are large, translucent, inexplicable icons of suns and clockworks and starbursts in pale yellows and oranges. (Later I discovered the souvenir booklet with these icons attached to the various sections; this code was completely lost to me during my first three visits.)

Rather than putting into shore, it's easier to pass on by without disembarking. And so, soon I'm at the end of the exhibition:

> "Wait a minute!"

And there's Mickey.

Structure

Because I came looking for constructed meaning, I swim back upstream, back to the beginning of *Time,* and sort out

the curricular scheme of the exhibition. Once the structure is apparent, it is relentless. What seemed like an open, free-choice gathering suddenly has an attitude, expecting that attention will be paid. In each section the subtitle is repeated several times in the section, on each text panel:

> *Marking Time: 1700-1820*
> "Americans were deeply mindful of time, but not of the clock."(x5)
>
> *Mechanizing Time: 1820-1880*
> "Increasingly, Americans let the clock tell the time and regulate their lives."(x4)
>
> *Synchronizing Time: 1880-1920*
> "The country struggled to adjust to clocks set to a national standard time."(x3)
>
> *Saving Time: 1920-1960*
> "Americans became obsessed with using time efficiently."(x3)
>
> *Expanding Time: 1960-now*
> "We try to get more out of time everyday."(x3)

Although I read—and reread—the words, I am still unable to see how Americans were deeply mindful of time, how the country struggled, or how we became obsessed.

There are several sit-down touchscreen computer stations. These devices were meant, apparently, to extend the reach and capacity of the relatively small exhibition area. But too often it is merely an expensive delivery system for words and graphics which could have added to the richness and complexity of the gallery experience for everyone. In *Expanding Time* I click on "The Quartz Standard" and find a picture of Warren Morrison, an engineer at the Bell Labs in 1977; click, and there's a quartz crystal. But there's nothing about the molecular signature of quartz, its resonance, or anything beyond the pictures, really. I wonder: why does this deserve digital memory space and expense?

Sometimes the content is completely redundant: in "Planning It All" you can click on several images of systems of personal organization—from a 1963 (paper) day book to a 1998 palm pilot. But then I find these very same objects are on the wall behind my stool.

Sometimes the content is simply not very accessible: when I ask "Who needs nanoseconds?" I get no answer; rather, this chatty response: "Your watch doesn't need to keep track of nanoseconds (billionths of a second), but your computer does." Now we're really down to it: a definition! Here is *time*—or at least a definition for a cool word about the time idea—the *nanosecond,* just like *Star Trek.* But it's buried three clicks deep in this software. And I still don't know who needs 'em. Or why my watch apparently doesn't.

At the end of these meanders is the waiting room.

"Wait a minute!"

Maybe something will happen. Or not. Maybe something will stop. Or not stop. Maybe something will end. And not be repeated. These were my thoughts while waiting.

Artifacts

Objects in *Time* are generally displayed. They are not enacted; they do not dance. They are sometimes in plexiglas rectangles, sometimes out in the open. The vitrines sit on (wacky?) arrangements of legs with no discernible reason for being that shape.

Great images are neglected, trivialized, hidden.

These objects are not in motion, nor are they still. They are splayed, displayed.

Objects are not seen in time, in experience, in moments, in events. Consider the General Electric refrigerator, Model T-7, 1934, an icon of the "efficiency" commodity. This is the only object you can approach in an appropriate spatial/behavioral context: there it is, I'm ready to open the door, figuratively speaking, but it's blocked by a wacky graphic.

Great images are neglected, trivialized, hidden. Consider in *Marking Time,* the area where our American experience with time continues before and without clocks: the Sun Dagger in Chaco Canyon, New Mexico. This ancient monument of American interaction with sun and planet is represented by a small photo in the back of a case. There is no resonance of urgency or ingenuity, no wonder at the scale of the device and the ritual event, this huge marking of time.

Perhaps the greatest hidden object is the greatest clock in the exhibition, the Tower Clock by Gardner Parker, 1801, for the First Church of Christ, Westborough, Massachusetts. The works are connected by an almost invisible cable to a bell from the McShane Foundry in Baltimore, 1801, which is hammered on time in the center of the exhibition. Following the cable, I found the Parker works is in a closet, barely visible through a slot in the wall opposite the wacky automaton, an almost invisible sentinel right at the entrance to the exhibition. Full of movement, beautiful in its precision, a model of perfect time: why has this great icon been hidden?

Where's the author?
One has the sense that a committee wrote this exhibition text, *trying to be clear.* And trying to avoid being authoritative: why else the bogus questions? Are we to believe this is the product of an inquiry-based approach to learning? Bah, humbug: they didn't want to come to the point, there being none.

It appears, once the committee wrote the text, that the designer was charged with making it fun and easy-to-take—with wrapping this mess of questions and non-responses in designer gestalt and making it appear to be an exhibition. There's nothing in the text to justify the wacky touches of the design, the simple, playful forms, the sort-of-primary palette. There is no synthesis of words and non-words. This is a collection of stuff, in cases, with graphics and "labels."

Something like a synthesis emerges in the snappy, accordion-fold brochure which is available at the entrance to the gallery. Actually, the structure of the content which I have quoted was only understood, after-the-encounter, from this brochure. Punchy in design, with literal punch-out images of clocks and watches, it conveys the simple, superficial "message" of the exhibition with great efficiency. Playing with the punch-outs, I wonder what all the fuss is about: why make an exhibition, if the content is so neatly conveyed in this tidy little package?

What about the expense of exhibition-making? If Time took more than four years to make (as reported in the *Exhibitionist*), why isn't it any better than this? We might forgive this casual assemblage if it were a short-term exhibition, one of a series playing with the complex issues of time. But this is the National Museum: this work will be with us for a long time. Our children deserve better.

Is this exhibition actually *On Time?*

What is time? There's no time spent defining the problem of defining the term. This exhibition simply breezes past one of the most vital questions of human intellectual history, one which preoccupied the preceding century. Does it move? Did it start? If so, what was "there" before the start? The twentieth century saw real revolution in the idea of time. Why not survey this *revolution* at the millennium?

Is it about American time? In the National Museum we expect diverse encounters with our complex cultures in the United States. How have Americans variously thought about time, when they did? Science has been banished from this exhibition, as has theology and cosmology, in favor of material culture. But I was not able to uncover distinctly American versions of the profound questions of time in the stuff. Consider the clock as cultural artifact, the iconography of the clockwork itself in Euro-American history: why do we think these works are beautiful? If this is not really an exhibition on time, but a display of our tools for "keeping" it, where's the music?

Remember the riddles at the beginning of *Time?*

"Who controls your time?"
Is it about corporate and government control of labor through the rationalization of production? Then why the wacky colors, the silly graphics?

"What role does the clock play in your life?"
Or is it about quotidian time, the dailiness of place and culture, where a sense of time is an essential artifact? If so, where are the events and eventspaces of that daily encounter with time?

"Do you have enough time?"
This is a provocative question: how do we measure *enough?* It could be about how we Americans have valued time, how this has changed over time: how we, in our specific time/space continuum, value lifetime, right now. Then why is there no provocation to reflect on the *value* of time, rather than its "kinds?" Why is there no image that entrances, no arresting space that helps us pause and consider the measure and value of time?

"Do you have enough time?"
Mostly, the answer is no: I need to move on to the next exhibition and then have lunch.

"How do you tell time?"
Did I come to the National Museum to talk about this?

Is it about time passing? About speed or stillness?
Or is it about clocks?
Maybe. There are many of them here.
Then why hide them?

"Can you ignore the clock?"

> Alice sighed wearily. "I think you might do something better with the time," she said,"than wasting it in asking riddles that have no answers."
> "If you knew Time as well as I do," said the Hatter,"you wouldn't talk about wasting it. It's him."
> —*Lewis Carroll, Alice in Wonderland*

Response to "Decoding San Jose's Tech Museum of Innovation"

On behalf of The Tech Museum of Innovation, we want to thank Marjorie Schwarzer and *Exhibitionist* for the thoughtful critique, "Decoding San Jose's Tech Museum of Innovation," in the Spring 2000 issue. It provides a valuable complement to the exhibit experience evaluation recently conducted by Randi Korn and Associates, Inc., other Tech visitor studies, and our ongoing self-assessments focused on improving operations. We appreciate the opportunity to respond to some of her questions and observations. Just as we embrace systematic evaluation for improvement, we welcome constructive criticism from our colleagues in the museum field.

Science Center or Museum?

In the introduction to her article, Schwarzer asks why The Tech calls itself a museum, not a science center. We are aware of the museum field's ongoing discussion about the term "museum" and have had many such discussions ourselves. When we opened our prototype museum in 1990 we were known as the Technology Center of Silicon Valley. We used the words "technology center" instead of "science center," because our focus was on technology rather than science. In this region—with its economic focus on technology—these words conjured up visions of a business center for technology companies rather than a place for interactive learning. The fact that we dubbed our facility "the Garage," in homage to the many Silicon Valley companies that started in garages, only confused people further. Clearly we needed to establish an identity.

We deliberated carefully before deciding on a new name that reflects our mission, "to serve as an educational resource that engages people of all ages and backgrounds in exploring and experiencing technologies affecting their lives, and to inspire young people to become innovators in developing technologies of the future." We considered calling ourselves "The Tech," but this meant nothing to people who did not already know us. The word "museum" is rich with meaning and implies an educational focus. It says we are not a store, a trade show, or an amusement park, but a place where people can learn in an informal setting using real objects. Although we are not a collecting institution, one of our guiding principles is that our learning platform incorporates contemporary, real technologies.

Learning at the Tech

What does it mean to learn at The Tech? How can we help visitors make meaning from their experience? What does it mean to "inspire the innovator in everyone?" These are a few of many questions Schwarzer raises about The Tech as an educational institution. These are also questions that The Tech has been grappling with since opening the new facility.

We want our visitors to leave The Tech with a sense of what to make of their experience. After a visit to The Tech's exhibits and programs, we want our visitors to walk away with an awareness of the multi-faceted nature of technology, a feeling that they have the capacity and the power to participate in decisions about how technologies are used, and a desire to learn more. Above all, we want each visitor to leave with the realization that, "I can do it." That is one way we are demystifying technology—by showing it is more common sense than intellectually remote. We are about hands-on encounters and explorations first, about meaning and philosophy second. And, we know that this is happening for some.

We know we have been successful when a child doesn't want to leave the computer take-apart activity until her parent suggests that they find things to take apart at home; when a teacher tells us that a Tech Summer Institute inspired her to continue teaching when she had been thinking of quitting; and when a mother from the Inspiring Families program—who learned about using the museum with her children—invites her local community group and their families for a field trip to The Tech.

One of The Tech's primary goals is to create compelling experiences that attract, engage and transform our visitors.

In her article, Schwarzer expresses concern that "it's a wow, but is it an aha?" Clearly, we intend it to be both. Creating "aha" experiences for *all* of our visitors is our biggest challenge. Our exhibit experience evaluations indicate that we have not been direct enough in revealing the complexities of the role of technology in modern life. We cannot be subtle.

Guided by our evaluations, we are developing new introductory exhibits for two galleries that will clearly state the big ideas and articulate how technologies impact visitors' lives. As we move forward with exhibit and program development, we are committed to strengthening the main message within each gallery with every project.

Societal and Ethical Issues

Schwarzer and others criticize The Tech for downplaying the "darker side" of technology. We spent significant time during exhibit development working with the Markkula Center for Applied Ethics at Santa Clara University to ensure appropriate treatment of societal and ethical issues. We know our content is strong, but our delivery needs improvement. We also realize that exhibits alone will not convey the social, ethical, and political dimensions of technology. It is our hope that coupled with our program opportunities, and incorporation of dramatic programming on the museum floor, we will provide our visitors with an experience that will provoke rich reflection and discussion. Further, we will continue our conversation about how The Tech should influence the way people think about technology. The Tech's "Policy Regarding the Treatment of Societal and Ethical Issues in Exhibits and Programs" specifies that we should help visitors develop science and technology literacy and help individuals reach their own conclusions regarding the use of science and technology. A revised process for developing and integrating content includes incorporation of societal and ethical issues among the key criteria for considering a project.

Moving Forward

Since Schwarzer's visit, The Tech has been working on process improvement, program development and exhibit remediation. The board of directors approved a new strategic plan that lays out clear goals. Results from our most recent visitor exit survey in July 2000 show significant improvement over the previous year. The Tech is committed to research and evaluation to determine audience and community learning needs and the effectiveness of our exhibits and programs in meeting those needs. We are open to new ideas and suggestions from our visitors, our community, and our colleagues. Although there are many things that require attention, we also know that there is much to celebrate.

Finally, we would like to invite Marjorie Schwarzer back. We welcome her critical input. We need to become an educational institution in every sense of the word—and we value the thoughtful, objective reflection that only an external professional can bring.

Jenifer Helms, Vice President, Education
Susan Wageman, Evaluation Manager
The Tech Museum of Innovation

Who Is the Audience for Exhibition Criticism?

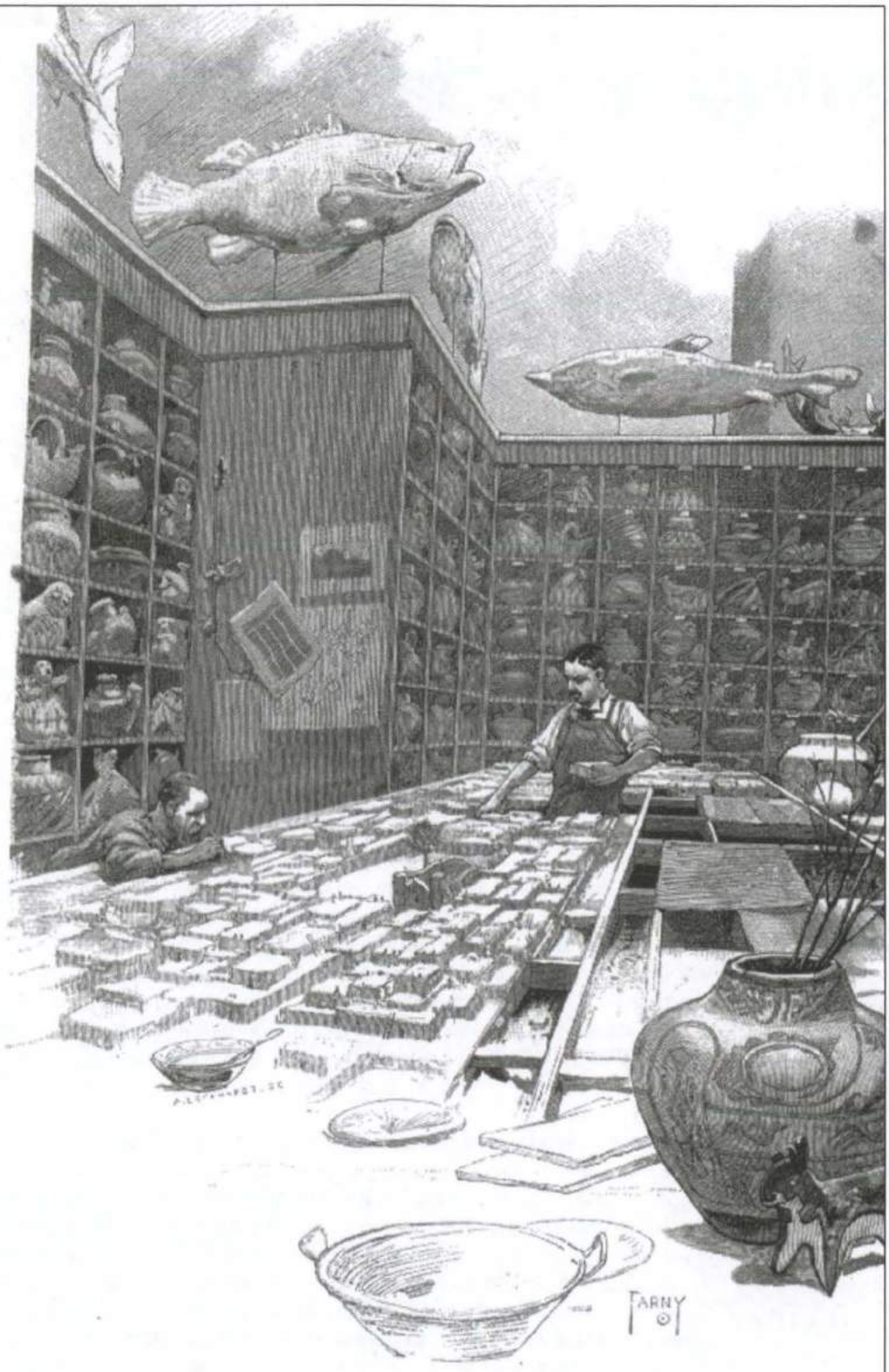
In all the discussion of exhibit criticism, it seems we're overlooking one important issue: the intended audience. When a newspaper columnist reviews a movie, he does so under the assumption that his readers have not seen the film, and will use his critique as one factor in deciding whether or not to buy a ticket. A sports columnist, on the other hand, recognizes that many of his readers have seen the performance (live or through the media), and it was a one-time event anyway. His job is to help them better understand what happened and why, and what is likely to happen next. Other reviews—of books, television, theater, concerts, etc.—generally fall into one of these two camps.

Exhibit reviews in the professional press occupy an entirely different ground. They must assume their readers not only have never seen the work in question, but are very likely to never see it. As an example, I am a reasonably well-travelled exhibit professional, and the Smithsonian is one of our country's premier museums. But when I went to see the "On Time" exhibit last May (spurred by personal interest, rather than the recent *Exhibitionist* review per se), it marked the first time in 25 years I'd set foot inside the National Museum of American History. I would venture to say that the overwhelming majority of professionals reading any given review will have not seen the exhibit in question, and probably never will. Are the reviews still meaningful and useful to them?

I am concerned that our reviews are not sufficiently cognizant of these limitations—that they do not give their non-visiting readership enough of a "you are there" feel for the exhibit under review; nor do they provide digestible "take-home" points that can be understood and applied by anyone, regardless of whether or not they have seen the exhibit.

It may be too tall an order to be adequately filled. But it is the challenge we face, if we want to make exhibit criticism useful to the profession.

Eugene Dillenburg
Lead Exhibit Developer
The Shedd Aquarium



A MODEL OF
ZUÑI.

"A Model of Zuñi",
The Smithsonian 1884
from *The Century Illustrated* magazine,
1884-85, courtesy of the
St. Louis Mercantile Library.

Making Meaning: The Conversation Continues

A Cyber-Forum with Ted Ansbacher, George Hein, Kathleen McLean, Jay Rounds and Michael Spock

edited by Tom Hacker

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At the 2000 AAM meetings in Baltimore, NAME sponsored a lively session on "The Meaning of Meaning Making," building on the articles in the Fall 1999 issue of Exhibitionist. *Over four weeks this past summer, several of the participants continued the conversation about meaning making for the following "Cyber-Forum," a discussion conducted through a special website.*

JAY ROUNDS: George, in the Baltimore discussions you argued that our attitude toward meaning making varies depending on our purposes. Some exhibits, you said, are like your novel-reading group, where the purpose is to be stimulated through a lively argument over what the novel means. The purpose is the discussion itself, rather than coming up with the "right" meaning. But it's different, you said, when "we put on our pedagogic hat" and have a specific bit of information we want to convey and want to be certain that the visitor gets it right. Then the type of open-ended meaning making enjoyed by the reading group "may not be what you want to happen." So what do we do in such a case? You've argued that "meaning making is an inevitable consequence of opening museum exhibits to visitors." But is there some way that we can manipulate the kind of meaning making visitors do in order to suit our purposes? Can we choose between whether our exhibit will support convergent or divergent meaning making? If so, how? Under what conditions is it legitimate to do so?

GEORGE HEIN: I want to redirect the discussion to look at pedagogy more generally.

Your description of my comments is accurate. I do think there are limits to constructivism as an educational theory. In fact, I think that constructivist pedagogy is an oxymoron, just as constructivist meaning making is a tautology. So we are caught between an oxymoron and a tautology!

Why do I think there are limits? This situation is a natural consequence of the definition of constructivism I favor, namely, that it describes the fundamental human quality of meaning-making, that is of making sense out of the phenomena that impinge upon us. That's where the oxymoron comes in. If each of us makes our personal (or socially mediated) sense of our experiences, how is teaching possible?

There are two categories where education does and should go beyond constructivism, one forced on the student and the other willingly accepted by a student. The first is legitimate, efficient and, perhaps, the only way to educate when we think health and safety are at stake for our pupils. Teaching our children about crossing the street, not to stick their fingers into the electric socket or not to climb over the fence into the lion enclosure at the zoo are examples of forced instruction. We, usually parents acting as teachers, don't care very much about the meanings our children might make of the situation, we resort to behaviorist educational approaches (and the negative reinforcement kind at that!) to drill particular responses into our children. These are examples of the bottom left hand quadrant of my categorization of educational theories. [EDITOR'S NOTE: See George's book *Learning in the Museum,* p.25.]

The other situation, which seems to work for me, is when there is a voluntary contract between teacher and pupil to accept the educational approach of the teacher. In this situation we don't rely on constructivist education (thus avoiding the oxymoron) and break the tautological relationship between constructivism and meaning making because both parties (teacher and

student) work together to develop particular meanings. In positive educational relationships, the pupil reports what meanings he or she makes of various "teachings" and it's appropriate for the teacher to say that a particular meaning is "wrong" or "right" depending on what the topic might be. The important point is that the two have agreed that this is the game they are playing, this is the task they have undertaken.

I'm sure all of us have put ourselves into the role of pupil; into situations where we agreed (out loud or to ourselves) to accept the instruction offered by our teacher. In my case, it's not always true that I was brave enough to report my personal meaning-makings to the teacher, but it was usually easy to decide whether my own understandings matched those my teacher expected me to make. Gradually, I learned the "correct" way, and as long as I knew I wanted to learn the canon of whatever I was studying, I could accept that.

"Most of the time I'm open to the serendipitous discovery of something that engages my interest and perfectly willing to ignore everything that doesn't."—Jay

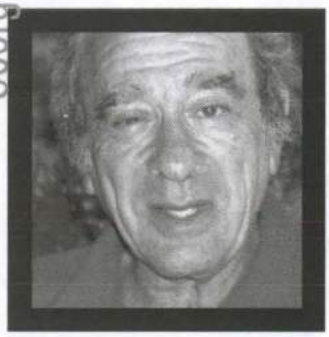
The difficulty for museums is that not all the general public is prepared to accept the second condition I've described. Further, even if some visitors do want to "learn," it's difficult (although not impossible) for museum exhibitions to accommodate the testing and back-and-forth communication required to make individual meaning making match canonical interpretations.

JAY: I like that idea of the "voluntary contract," George. When I want to know something specific, I'm willing to be lectured to and "to be told the right answer." And sometimes I do use museums that way. Once when I was wondering about some birds that had started patronizing my back yard, I went to the Museum of Natural History's bird hall specifically to find out what they were, and I now share the canonical interpretation of "house finch." On another occasion I went to look at the Mesoamerican collections by way of preparing for a vacation in Yucatan, and I've frequently visited house museums to pick up specifics on architectural detailing and appropriate furnishing for my own homes.

Still, I have to admit that I don't use museums to find out that kind of specific information very often. Most of the time I'm just engaged in a kind of omnivorous browsing, without anything specific that I want to learn about, open to the serendipitous discovery of something that engages my interest and perfectly willing to ignore everything that doesn't. I think of that kind of visiting as being oriented toward personal meaning making. The other kind—the trip to find out the name of the birds in my back yard—seems to me to belong to a significantly different category of behavior.

KATHLEEN McLEAN: George and Jay, I also like the notion of a "voluntary contract." If we visualize a learning continuum, with the forced, behaviorist experience (George's bottom left hand quadrant) going off in one direction, and the most expansive notion of personal meaning-making going off in the other direction, then I see the "voluntary contract" zone in between to be the most interesting and applicable to what we do in museums. Certainly, the contract is not as obviously articulated as in a classroom setting, but it is there nevertheless. And I would argue that the majority of visitor experiences in museums are somewhere between the type of voluntary contract evident in a classroom setting (the classical focus of museum education) and the meaning making that is so personal that it is hard to contain or explain in any rational

George Hein



"I think that constructivist pedagogy is an oxymoron, just as constructivist meaning making is a tautology."

way (where the museum learning pendulum seems to have swung in the last few years).

How much authority we bring to the contract, and how much credit the visitor gives us, is what makes for the interesting and dynamic environment we call museums, don't you think? Can't voluntary contracts also be two-way streets (in other words, can't there be constructivist voluntary contracts)? Lois Silverman has cited Robert Crosman's definition of three types of meaning: the speaker's intention, the common understanding, and an individual's subjective value of something. I found this really helpful, because it describes for me the different worldviews we have had in the museum profession: the speaker's intention has always been the primary focus of our efforts. In reaction to that narrow worldview, we have jumped to the individual's subjective value of something (what I think most of us in the field today are defining as "meaning making"). And then there's the "common understanding." I believe it is in the realm of common understanding that we, museum staff and museum visitors, have the greatest opportunities to grapple with making meaning.

TED ANSBACHER: I agree with George's basic definition of constructivism as "making sense out of the phenomena that impinge upon us," but I do not see a contradiction between that and pedagogy—only a radical change in pedagogy. Instead of "telling" or "communicating" the teacher (museum) now assists the student's (visitor's) process. The teacher's tasks become (1) enlarging the experience/phenomena base (which, I believe, is the primary role for exhibits) and (2) developing the process (sense-making) skills—basically a coaching model of teaching. There are two misunderstandings of "meaning making" that are quite prevalent and seem to bear on parts of our discussion. The first is that you have to make meaning all by yourself. Of course the meaning you end up with is your own (the last of Jay's "personal" definitions) [*see sidebar*], but in striving to make sense of one's own experience, there may come a point when it is helpful to find out what sense other people have made of their experiences; in other words, find out what is already known. (Ancient wisdom: Wise people learn from others' experience; average people learn from their own experience; and fools never learn.) As I am hearing it, George's "voluntary contract" seems to encompass this learning from other people's experience, and to me this still fits well within constructivist theory. A second misunderstanding is that accepting that people make their own meanings implies that all meanings are equally good ("rampant relativism"). Indeed, science can be thought of as a more rigorous meaning-making process in which people pool their individual meanings to reach collectively "better" meanings. But this leaves open the question of whether it is our task to help all visitors to reach these collectively better meanings. I believe it is not. And even if it were, the only way to get there would be by letting visitors first develop their own/individual/personal/idiosyncratic meanings.

MICHAEL SPOCK: George, I'd like to gang up with Ted in challenging your narrow definition of pedagogy. Specifically, I want to lodge a semantic quibble with your

What's "personal" about personal meaning making?

One connotation of "personal meaning" is "idiosyncratic," suggesting that the meaning made by this individual is significantly out of step with a well-established canonical meaning appropriate to the situation—and thus is a "wrong" meaning, from the point of view of the gatekeepers of the canon. We don't want individuals developing idiosyncratic interpretations of the meaning of traffic laws.

A second connotation of "personal" is "irrelevant to broader concerns," in the sense that the meaning has to do with a situation so strictly limited to the person making the meaning that there is no canon to be violated. At the AAM session George pointed out that in thinking about the meaning of works of art "it doesn't make any difference" whether an individual's interpretation is the same as anyone else's. No one else has a significant stake.

A third connotation of "personal meaning" has to do with whether the person's process of meaning making is conducted entirely individually or through interaction with a social group such as "a community of learners." This issue of the character of the process is conceptually separate from the question of whether the process leads to an idiosyncratic or canonical meaning.

A fourth connotation is that "personal meaning" refers to the purely individual implications of a widely-shared, canonical meaning: "What does it mean for me?" The individual accepts a common meaning as given, but then needs to work through how to apply it to his or her own life.

A final connotation is to assert that ALL meanings are necessarily "personal," since we construct meanings through the agency of mental constructs that we have built up over a lifetime of experiences—a lifetime that is never exactly like anyone else's. Even when we can articulate the relevant canonical meaning in a given situation, that doesn't prove that the underlying mental structure is the same as that of others. Just as many different biological genotypes can produce the same visible phenotype, different mental structures can produce the same answer to a given question—but that doesn't guarantee that they'll produce the same answer to the NEXT question.

All of these connotations seem to me to have validity for specific situations, but we need to make it clear which one we're talking about. Just saying "personal" meaning isn't enough.

—Jay Rounds

assertion that constructivist pedagogy is an oxymoron. When you defined the upper left-hand corner of your educational model as "didactic, expository" I was with you, but you lost me when you equated this with "pedagogy." My definition of pedagogy, or the art of teaching, like Ted's, allows for more than the behaviorist model of an active teacher delivering canonical knowledge to a passive learner. I see teaching—good teaching—as not just instruction, but also as the process of stimulating learning or providing a fertile setting for learning; teaching-learning even in the sense of helping the student make personal meaning (in both of Jay's fourth and fifth connotations) out of an experience.

I'm still hung up on the semantics of pedagogy/teaching because I'm worried that your implied definition, unchallenged, may turn up to haunt us when we begin to explore the subset of meaning-making associated with stimulating and provocative exhibits. I am thinking of exhibits that may have the appearance or even the intention of canonical teaching, but that also allow or invite or stimulate or challenge visitors to make what meanings they will of Ted's "building materials." The Science Museum of Minnesota's "Wolves" exhibit of some years back was jammed with expository information, but also it seemed to me adopted a constructivist strategy in presenting the divergent perspectives of different stakeholders in a way that allowed or encouraged you to think about where you would come down in their argument about the value of wolves.
I'm worried that if we move on to discussing exhibitry without acknowledging this broader notion of pedagogy or teaching as a contributor to the visitor's opportunity to construct personal meaning from our exhibits, then we may inadvertently vacate the active role of the exhibitor in creating the provocative ideas and stimulating environments that contribute to personal meaning-making.

I would also like to get on George's "voluntary contract" bandwagon and agree with Jay and Kathy that it may be a productive zone of inquiry since it includes the most frequently desired outcomes of the exhibit development process: "the common understandings." But I also don't want us to lose track of the possibility that personal meaning making and our professional drive to convey specific meanings sometimes intersect beyond these contracts. Some of the most skillfully developed exhibits succeed in drawing us into one of George's volitional contracts, sometimes almost in spite of ourselves. When this happens a lot of the explicit meaning is conveyed in a way that would gratify both the exhibitor and ourselves. Frequently when I'm in Jay's "browse mode" I will be captured by a striking object, provocative idea, or beautiful setting in a way that compels me to contract with the exhibit to make my personal meanings through its intended meanings. In other words there is a happy intersection of my personal agenda with the exhibitor's professional agenda so that we unexpectedly come to a common understanding. But that contract was not volunteered or agreed to on my way into the museum or even the exhibit.

GEORGE: I said that partly (but only partly) to be provocative. Pedagogy is whatever we do (as teachers) to support our educational aims. These aims are, of course, circumscribed by our basic beliefs of how education takes place. I agree with you, Mike, (and with Ted and Jay) that pedagogy or the art of teaching, like Ted's, allows for more than the behaviorist model of an active teacher delivering canonical knowledge to a passive learner. I see teaching—good teaching—as not just instruction, but also as the process of stimulating learning or providing a fertile setting for learning; teaching-learning even in the sense of helping the student make personal meaning (in both of Jay's fourth and fifth connotations) out of an experience. "Constructivist pedagogy *MUST* help the student make personal meaning." (With a caveat for Ted's misconceptions about personal meaning making, which I accept.) But I suspect we all agree that this process includes more than drill and memorization.

Where does that leave us? I guess the point is that there is a pedagogy associated with constructivism, but it's not the "now-hear-this kind," but rather an invitation to learn.

"I strongly feel that most "meaning-making" discussions are so theoretical and philosophical, they loop back onto themselves and don't help practitioners grapple with many real life issues."—Kathy

Ted, the reason I chose the word "contract" is because it takes two, i.e. both sides, to make the contract. They both have to shake hands on the deal. The formal, school contract involves the student and teacher *AGREEING* to the relationship. (Needless to say, there's lots that goes on in school outside the context of a mutually agreed upon contract.)

So, what is the contract in the museum? Similarly to formal education it only exists when the exhibit developers consider what kind of contract the viewer is (implicitly, usually) willing to accept.

So, as a necessary condition for the "contractual" relationship we need exhibit folks (and educators, designers, etc) willing to see exhibits as a form of communication. Accepting visitor studies, finding out what visitors are doing. Doing what we are engaged in with this conversation-going back and forth

trying to clarify, adjust and expand ideas. How that happens in the exhibit development process some of you know better than I do.

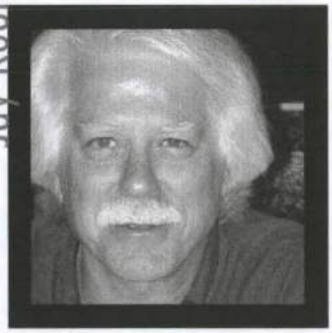
KATHY: So, good, we all seem to be on the same page, so let's get back to the notion of "common understanding." I raised this question earlier because I strongly feel that most "meaning-making" discussions are so theoretical and philosophical, they loop back onto themselves and don't help practitioners grapple with many real life issues. Many people in the field see these kinds of discussions as promoting "rampant relativism," and throw their hands up and just continue to do what they've been relatively "successful" at doing for the past five to ten to twenty years. The purpose of this discourse, it seems to me, is to help exhibit and museum professionals be more reflective in their practice, and perhaps better understand the dynamics at play in a museum exhibition environment. Which to me seems to bring us back to "common understanding" of the intent of the presenter and the experience of the visitor, or perhaps, the possibility of orchestrated meaning-making between/among the presenters and the visitors.

JAY: As George pointed out, sometimes it's important to get people to a "common understanding," and sometimes it isn't. There are at least two distinctly different circumstances that warrant "convergent thinking" that leads to common understanding. The first is when the individual needs to learn the pre-existing canonical interpretation—to get "the right facts." The second is when a group of people need to converge on a common meaning of something for which there is no relevant, pre-existing canon. Perhaps the latter type does occur among groups of visitors (such as families), but it seems to me that it would be very rare circumstances when museum professionals and visitors would need to negotiate that kind of new common understanding. Anyone have examples of such a situation?

So the first type would seem to be more relevant. Helping visitors acquire the canon may be relatively straightforward when we're just looking at simple facts ("This mission was built in 1782."), but becomes very problematic when we start dealing with more complex systems. As George said, that kind of meaning making requires a feedback loop of "testing and back-and-forth communication" that he argued is "difficult (although not impossible) for museum exhibitions to accommodate."

I think that what happens in most cases is a linear sequence, rather than a feedback loop. The exhibit creator makes a meaning that is encapsulated in the exhibit, then the visitor makes a new meaning based on his or her experience of the exhibit. This doesn't mean that the two meanings are unrelated. The designer's meaning acts as a constraint on the meaning making of the visitor, but not as an absolute determinant.

Jay Rounds



"The designer's meaning acts as a constraint on the meaning making of the visitor, but not as an absolute determinant."

TED: It seems to me that constructivism's biggest practical lesson for exhibit developers is that you *CANNOT* impart "understanding" directly to visitors, all you can do is present things/phenomena from which they will make their own meaning (which is true even if the "phenomena" you present are written words). So even if the developer's intent is that visitors reach some "common understanding," the design goal has to be in terms of what people will be able to see and do at the exhibit that will provide the "building material" from which they *MAY* "construct" that understanding. There is no way to get all visitors to construct the same understanding, however. So I think we should not set criteria for exhibit success in terms of reaching "common understanding," but rather in terms of visitor engagement with the exhibit.

KATHY: Still using George's "voluntary contract" as the touchstone, let's for a minute shift the balance of the contract away from the *TEACHING* model of the classroom (the "teacher" and "student" in a voluntary contract infers a specific kind of relationship), and move the balance of the contract more towards a *LEARNING* model (where all participants are active learners). Now, the notion of "common understanding" suggests a very different kind

of relationship. No longer in canonical territory, we, exhibit developers and visitors, can actually explore ideas and questions and mysteries *TOGETHER* (which I think all exhibitions should strive for). If we, as exhibit developers (and all museum professionals) think of ourselves as co-learners and co-explorers with our visitors, we might actually be more open to openendedness and we might find the "personal meaning-making" of visitors much more interesting and relevant. It seems to me that striving for a common understanding doesn't mean we all agree on some reductionist fact or "truth" or coming to some conclusion, but rather that our "voluntary contract" is a commitment

"We should not set criteria for exhibit success in terms of reaching "common understanding," but rather in terms of visitor engagement with the exhibit."–Ted

to engaging in a continuing process of inquiry. For me, this notion completely shifts my operating framework and forces me to focus on questions—what is unknown, or what is still undiscovered, connections yet to be made—that I can explore with the people who help me make an exhibition and the people who come to the exhibition.

MIKE: Maybe the most interesting and amenable territory of personal meaning-making rests in those experiences we can participate in as both museum visitors and museum practitioners. For example, I'm intrigued when a puzzling natural phenomenon is restaged in a science center and finally makes sense to me because it's embedded in an exhibit's contextual surround in such a way that it limits the number of variables I have to deal with, or asks me to pay particular attention to some special feature of the phenomenon, or stimulates me to think metaphorically about what I am seeing. I can remember hovering over a cloud chamber at the US pavilion in Seattle way back in '62 and being blown away by the realization that the atomic structure of my body was porous enough to allow cosmic rays to shoot right through me and leave a trail of bubbles in the chamber's liquid medium. While I have to admit I was picking up a dab of canonical scientific knowledge and certainly quite a bit of respect for the power of a scientific tool, the real meaning I made of this elegant exhibit was how hard it is to grasp the scale of subatomic structure and how tricky it is to directly observe the true nature of things. It seems to me that these kinds of meaning-makings—the open-ended, co-learner, co-explorer experiences that Kathy is steering us towards—will have the greatest payoff for museum practice. Visitors and we can do things together in ways that help both of us explore and "construct" exhibit experiences.

GEORGE: I'm glad the idea about contracts has gotten positive response from several of you. I've long felt this was important, but wasn't quite able to articulate it. I now think that you need to develop the relationship between teacher and pupil, but that there are many different kinds of contracts.

The school-contract which involves sitting for long periods of time in return for being able to pass exams (not a nice way to describe school, I know) is simply a different contract than the one I have with my wonderful childhood friend and current violin teacher. (That's a story in itself.) It's also different from the implied "contract" that Jay described earlier as his "browse" mode.

Maybe this is an area that needs empirical research. What kind of contract(s) are visitors interested in making in museums? The answer is related to the crude categorizations of visitors that we have had. The expert has one kind of contract in mind, the typical family visitor another. Some come to browse, the exhibit is only background for social contracts, while others come to be enticed and seduced by the exhibits. And so on.

Ted Ansbacher

"There is no way to get all visitors to construct the same understanding"

Yes, Kathy, I think the relationship between exhibit and viewer is somewhere "in between behaviorist preaching and personal meaning making" but perhaps this isn't a linear relationship, but a set of contracts that differ in kind?

JAY: George, you're absolutely right about there being qualitatively different types of "contracts." One fundamental differentiation has to do with "goal orientation". Your "school contract" type is undertaken because the learner has a goal with a clear outcome in mind—acquiring specific substantive or procedural knowledge. Because this fits our ideas about rational behavior, we tend to project this model onto all contracts—that is, we assume that they're all "goal-oriented," all undertaken for the purpose of achieving outcomes that we can specify in advance. That's why most of our visitor research focuses on outcomes. We assume that behavior has to be explained in terms of its practical utility.

I don't think that most museum visitation is motivated by specific outcomes. Rather, I think the most important problem in understanding visitor motivation rests in the fact that most museum visitation constitutes an investment in behavior for which there is no immediate utility, and for which any presumed long-term utility is unpredictable and highly speculative.

Kathleen McLean

"I think museums, curators and exhibit developers need some destabilizing elements to get us to think more creatively about what we are doing."

KATHY: I keep feeling like we are only having half of the conversation, and the easy half, at that. We keep focusing on the visitor, but we also need to focus on the presenters—museums and exhibit developers and curators—and the implications of "personal meaning making" on our practice. I am assuming that this topic of "meaning making" has had such legs in the past few years because practitioners feel a need to swing the pendulum back from its extreme position in the "educational goals" domain. The limitations of thinking of exhibitions as primarily teaching tools have driven us to balance our (the field's) perspective. (Regardless of the increasingly intense pressure for educational accountability from funders.)

I recently attended a conference at UC Santa Barbara on "Return to Wonder: Rethinking Museum Display in an Age of Didacticism," which, in addition to promoting the idea of going back to the wunderkammern model of display, also questioned the emphasis on *teaching* and *learning* goals in exhibitions. And while it was refreshing to come together with scholars from a variety of disciplines to look back on the curiosity cabinets of old (and see some new attempts at creating modern curiosity cabinets), what was missing from that conversation was any discussion of the intentions (and accountability or responsibility) of the exhibit developers or creators. With so much focus on visitor personal meaning making, we keep obscuring the intentionality of the exhibit developer or museum as presenter. Sure, everyone is engaged in personal meaning making. So what do we, as museum professionals, do with that information? As Ted says, we can perhaps distill some qualities that make good exhibitions. And we can think of exhibitions as places to browse. Or as novels. But I keep getting this nagging question about the role we (exhibit developers) play in all of this. Not just as a question of practical application, but also philosophically. Why are we doing this work? Spending all of this money? Who really benefits from it? If profound transformations can happen in exhibitions, what is our role in making that happen? In the extreme constructivist model, we could put absolutely anything in a space and call it an exhibition, and someone would make some meaning out of it.

I really like the idea of a voluntary contract because it makes us think about our own role in it all. I think museums, curators and exhibit developers need some destabilizing elements to get us to think more creatively about what we are doing, our intentions, and ultimately, the exhibitions we create.

TED: Regarding our (exhibit developers/designers) intentions, I think the shift is from what we want people to know to what we want them to see and do at the exhibit. Just see and do any old thing? No. "The belief that all genuine education comes about through experience does

not mean that all experiences are genuinely or equally educative."—John Dewey. A way that I find helpful to think about what is worth doing is that we are helping people explore and understand an area (topic, area of interest, phenomena, work of art, etc.) in much the same way that an expert in that field does. This does not, of course, mean reaching the same level of sophistication and knowledge as the expert, but seeing some of the things that are of interest, asking some of the same kinds of questions, etc. I think of the quote from Frank Oppenheimer of a tree being such a good interactive exhibit, even though it has no manipulable parts. He pointed out many of the things that an expert would see in the tree, and that the novice could begin to wonder about. Part of our job as exhibit developers would

"The exhibits that have had a lot of meaning for me had this sense of a personal invitation from the exhibitor."—Mike

not be just to make the tree (and of course we know the only one who can do that anyway), but to figure out how, by signage or personal contact, to help the visitor see/explore it. And it must be clear that helping someone to explore is *NOT* the same as didactic teaching. For this approach, it is the starting point (the tree) that all visitors will have in common, and from which each will follow his/her own path to different end points. For the didactic approach, it is a common end point that is being aimed for. So I think at least one answer to Kathy's "nagging question" is that the role we are playing is to make accessible or open up interesting areas that most visitors would not otherwise have access to. And the way we do that is by providing them with good materials from which to construct their understanding *AND* by providing guidance and encouragement. So our (the museum's) role is that of the expert, not to tell people everything we know, but to bring them along with us (or at least start them on that journey).

MIKE: All this talk about the developer's intentions in the creation of meaningful exhibits is important. I think Ted's got it pretty nearly right in suggesting our job is to intentionally bring visitors along with us. It's almost as if the exhibitor is saying, "Something interests, troubles, inspires me, and I'd like to share it with you. Make what you will of it, but I don't want you to wander off without getting some sense of why it turns me on." The exhibit developer—a living, breathing, feeling person—wants to bring us along with them because they think it matters.

The exhibits that have had a lot of meaning for me had this sense of a personal invitation from the exhibitor. Bernard Rosofsky's splendidly idiosyncratic "Now I Lay Me Down to Eat" at the Cooper Hewitt, Ned Kahn's gorgeous tornado and sandstorm at the Exploratorium, the moving "Everything Must Change" object theater piece that anchored the "surviving loss" section of "Families" at the Minnesota History Center, all said "Hey, pay attention to this. It's interesting. It's worth your time." These exhibit creators had ideas and passions. They might be cranky and opinionated and demanding, but they all captured and moved me—brought me along intellectually and emotionally.

This doesn't suggest that visitors can't make real but unintentional meanings out of random museum encounters, but when we ask the intentionality question, my most meaningfully exhibit experiences happened when developers intentionally invited me to surf on their personal enthusiasm and knowledge.

GEORGE: I want to agree with Mike's comment about the value of strong, personal messages from imaginative exhibit developers. They draw us in to the developers' world and make us want to understand what he/she is trying to tell us. Just as a good novel does. I make my own interpretation, but I'm more than casually interested in what the author was trying to say. Otherwise it's a boring world filled only with my own ideas. You can't expand your own knowledge without something to add to what you already know.

The continuation of Dewey's quote that not all experiences are educative is that repetitive experiences aren't. So novelty, imagination, showing you something that you hadn't seen before or had not thought about ranks high. It doesn't assure that you will make richer meanings, but it sure helps. It's necessary if not sufficient.

Some of my favorite museum experiences include a natural history museum in Svedborg, Denmark, where one taxidermist collected and exhibited all the native species he could find in Denmark (mostly sea birds!) and at the Barnes collection, precisely because it was so idiosyncratic. (Dewey was a great fan of Mr. Barnes.)

TED: "Bringing the visitor along" always struck me as Frank Oppenheimer's intention, and I have frequently used his quote: "The surest way to delight others is to find what is a delight to ourselves and to the people we are fond of." This is the concluding sentence from his article "Everyone Is You...Or Me" (*Technology Review,* June 1976; reprinted in *The Exploratorium,* Special Issue, March 1985) Really, the whole article is about "bringing people along"; well worth rereading.

Have Things Really Changed That Much?

TED: I was interested to hear Kathy's impression that the whole museum pendulum is swinging away from a didactic approach, and would be interested in other's opinions on this. When I talk to my mostly like-minded colleagues I get this impression too. But when I go out in the real world (well, mostly the science museum world) I see lots of information heavy exhibits, computer terminals passing for "interactives," fun-and-games devices instead of valid hands-on experiences, etc.; and PR pieces touting the scientific principles visitors will "learn" from all this. For example, a fairly extreme example of an information-transmission exhibit is the latest astronomy exhibit at the AMNH.

JAY: My experience has been pretty much like yours, Ted—lots of talk about moving beyond information transfer, but new exhibits that look pretty much like the old exhibits, except that they cost more. Of course the mere presence of "information" can't automatically define an exhibit as belonging to the old paradigm. Meaning-making exhibits will almost certainly contain information; the differences will lie in such factors as the type of information, the way it is presented and contextualized, the presence of additional elements, the relative stress among elements, the depth and complexity of the structuring of the design as a whole, the underlying point of the whole exercise, and the grounds for evaluating success.

One of the problems, I think, is that we don't yet have exhibits that are widely recognized as persuasive exemplars for the approach—important exhibits that everyone can point to and say "That's how you do a meaning making exhibit." I agree with Kathy that we need to push our discussion on to the implications for practice. What do we, as exhibit creators, do differently under a meaning-making model than we did under the information transfer paradigm? What's our role in the meaning-making process?

At the same time, I think that talking will only get us so far in working out the implications of the new model. Obviously I believe in the importance of these kinds of theoretical discussions; otherwise I wouldn't spend huge numbers of volunteer hours editing a journal. But problems of practice have to be solved through practice: through new exhibits that catch fire as persuasive exemplars, to which we can then apply the theorizing that clarifies exactly why the exhibits work so well. Just like visitors do: first comes the exhibit experience, then the meaning.

So our discussions alone won't provide final answers to the questions that Kathy has posed so eloquently. Those answers can only emerge out of a dialectic between experiments in practice and experiments in thought. The most immediate implication for practice is that the field should be doing everything possible to encourage creativity and radical experimentation in exhibit development, to maximize our pool of possible exemplars of a new paradigm.

I don't see much evidence of that. Instead, I see the field acting as if we have a solid paradigm in hand, and our only problem is to ensure its systematic implementation. Instead of mechanisms for encouraging bold experimentation, we're elaborating systems for pushing conformity with existing "best practices," writing "standards of excellence" as if we knew what that meant, pushing museums to conform with assessment guidelines, talking about certification or even licensing of both museums and museum professionals, and relentlessly pursuing evaluation of outcomes as if we really understood what they ought to be. All these are sensible things to do when you have a strong, stable paradigm—when you know what it is that you should be doing, how to do it, and how to tell whether it worked. But that's *NOT* where we are in the field right now, and such attempts to apply the strategies of stability when you're in a time of change become a way of stifling creativity just when you need it the most.

KATHY: Whew! You said it. I have a dream. It is to just *DO* an exhibition that I think could be an exemplar. And I think I will have to do it outside the frame of a museum or science center, because there are too many unnecessary constraints at work inside. First there's the organizational culture and style. Then there's too many stakeholders, too many fears and too much self-censorship, too many pedagogues at work. I would simply like to create one exhibition with my own teams and my own ideas and then let people experience it and let it speak for itself. Sounds suspiciously like art, no? Maybe it is, maybe we haven't thought enough about the creative aspects of making an exhibition (gets back to Jay's notion of a novel). So, perhaps we need patrons who will pay for the making of an exhibition without trying to direct it in any way. I've always thought it would be wonderful to have several people create *very small* exhibitions as a design exercise, perhaps all around the same theme or subject, display them together, and then let people attend all of them for comparison.

TED: We may not have widely recognized examples, perhaps, of entire meaning making exhibitions, but I am sure we could all come up with examples of good exhibit units. And I think Mike Spock's "pivotal museum memories" provide just such examples

MIKE: Ted, I agree with you and Jay that there is scant evidence of Kathy's shift on the ground—yet. The landscape looks pretty much as you described. There are a few recent exceptions like the Field Museum's wonderful "Sounds from

the Vaults" where technology was used brilliantly (alas, now disassembled) to allow you to "play" the fragile ethnographic musical instrument collection on display. Or "Airworks," the tiny DuPage Children's Museum's profound exhibit that encourages you to explore the qualities of air in motion by introducing a variety of commercially-available, museum-made or visitor-constructed devices and materials into moving air streams. Both "Sounds" and "Airworks" are true meaning-making landmarks, on a relatively barren landscape. And yes, the AMNH's disastrous astronomy exhibits on time and distance scaling are only the most recent and perhaps most poorly realized examples of our persistent focus on information-transfer.

"I don't think we have to give up the "educational" goal of exhibits, we just have to redefine successful pedagogy as incorporating meaning making." –George

Let's begin to talk about the tough issue of accountability and the criteria for success. My hunch is that meaning has been made when a powerful memory has been constructed. In other words, meaningful exhibits are memorable exhibits. The Philadelphia stories seem to support this. The narratives about pivotal learning experiences tended to go back a long time and often the full meaning of the experiences were not revealed until many years later. They took time to ripen. Which makes it tough to demonstrate that meaning has been made.

Absent broadly helpful retrospective studies like these, there doesn't seem to be much we can do to hold a particular developer and their exhibit accountable. What more immediate evidence might we collect about whether an exhibit is provoking meaning-making or not? I think it will take some careful work to see if they are reliable measures, but the length and apparent intensity of a visitors involvement with an exhibit, or the animation and content of a social exchange triggered by an exhibit might be revealing of meaning-making. In Boston we came to believe that total and sustained absorption was an indicator that something important was happening between the exhibit and the child. This belief was intuitively not objectively based. Anyone got other ideas?

GEORGE: To me, at least some of the problem comes from the lack of language to describe learning in a constructivist world. I don't think have to give up the "educational" goal of exhibits, we just have to redefine successful pedagogy as incorporating meaning making. (Here I'm quoting some of you!)

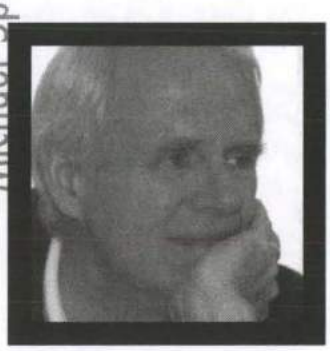
What we need as a strong description of knowing more of educational progress that is separate from any focus on content.

Here's a start of that cribbed from a book I just read on science education (p. 16, Jerry Wellington, *Teaching and Learning Secondary Science,* Routledge, 2000). It's a text intended for secondary school teachers. The author talks about "dimensions of progression in a person's knowledge and understanding:

> From narrow to broad
> From simple to complex
> From using everyday ideas to using scientific ideas
> From knowledge that to knowledge how and why things happen
> From qualitative explanation to explanations using numbers, formulae and equations
> From explanations based only on observable entities to explanations using unobservable idealized entities"

I know this is only about science, but you get the idea. We can, and have to describe expected outcomes of successful meaning making as distinct from the inevitable meaning making, which might be that the meaning of the exhibit is that museums are dreadful.

Michael Spock



"Meaningful exhibits are memorable exhibits."

Thirteenth Annual Exhibition Competition

About the Competition

The 13th annual Exhibition Competition is the joint project of the following AAM Standing Professional Committees (SPCs): Curator's Committee (CURCOM), the Committee on Audience Research and Evaluation (CARE), and the National Association for Museum Exhibition (NAME). The competition recognizes outstanding achievement in the exhibition format from all types of museums, zoos, aquariums and botanical gardens.

Judging is based on the document Standards for Museum Exhibitions and Indicators of Excellence available from the SPCs. Judges can award one first place and one or more honorable mentions in each category. Competing institutions are divided according to budget: those with project budgets up to $50,000 and those with project budgets over $50,000 (both excluding staff salaries and benefits).

Eligibility

Any noncommercial institution offering exhibitions to the public may participate. Entrants need not be members of AAM. The exhibition must have opened to the public during 2000.

Entry Fees

A $50.00 fee is required for each exhibit entered. Make checks payable to the AAM Curators Committee. For multiple entries submit one check for the entire amount.

Notification and Presentation of Awards

Only winners will be notified. Each winning exhibition will be featured in a program at the 2001 AAM Annual Meeting in St. Louis and will receive national recognition in the AAM publication *Museum News*. Staff from winning institutions will be expected to present overviews of their exhibitions at the AAM annual meeting.

Competition Policies

The SPC sponsors are not responsible for lost or damaged entries. All entry materials become the property of the Curators Committee and cannot be returned. Entrants agree to allow AAM and the SPC sponsors to use photographs of winning exhibitions, at no charge, in AAM publications. Entrants warrant that they have the right to allow such use. Institutions will be credited in any published reference to winning entries.

The exhibit will be judged based on the *Standards for Museum Exhibitions and Indicators of Excellence*, available from the competition coordinator or from the coordinators of the sponsoring SPCs.

To Enter

1. Complete the entry form.
2. Attach your check to the form. Make checks payable to the AAM Curators Committee.
3. Include 4 copies of each of the following materials to be used in judging:
   - Set of slides (not more than 20) depicting a walk-through of the exhibition. The purpose is to give a sense of the exhibition as a whole and not to highlight individual objects. Videos that supplement the exhibit may be submitted as a fulfillment of the optional materials category. Each slide should be labeled with the institution's name.
   - Narrative (not to exceed 10 double-spaced pages) of the exhibition that addresses the appropriate points in the Standards for Museum Exhibitions and Indicators of Excellence, which cites the criteria for judging entries.
   - Label text to include the whole text, if brief; otherwise, submit major concept labels and samples of subordinate labels.

- Brief description of associated educational programs and publications.
- One-page exhibit budget with total cash costs and major subcategories. Do not include staff time.
- Single sheet floor plan of the installation.
- Evaluation materials. What methods were used to gauge the exhibition's effectiveness in presentation of concepts to the intended audience? Include results. This may be incorporated within the ten-page narrative.

Optional Materials:
(include four copies whenever possible):

- Exhibition reviews from media.
- Publications, such as catalogues, visitor guides, educational materials, promotional brochure(s), exhibit-related programs, and videos, not to exceed five items. Please label each item with the museum's name and the exhibition title.

Entry deadline is January 5, 2001

Thirteenth Annual Exhibition Competition

Entry Form

Exhibition Title _____

Name of Your Institution _____

Address _____

City/State/Zip _____

Phone/Fax _____

Contact Person _____

AAM Region _____

Amount of Check enclosed $ _____

Budget Category:

❑ less than $50,000 ❑ over $50,000

Exhibition Category

❑ Anthropology ❑ Art

❑ Children's ❑ Physical Sciences

❑ Natural Sciences (including zoos, gardens, aquariums) ❑ History

❑ Other (describe) _____

Please separate the entry materials into four collated sets. Send entries to:

Michael D. Blakeslee, Competition Coordinator
C/o Museum Exhibition Planning & Design
4741 11th Avenue South
Minneapolis, MN 55407

(612) 825-0559
mdblakeslee@earthlink.net

Entry deadline is January 5, 2001

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