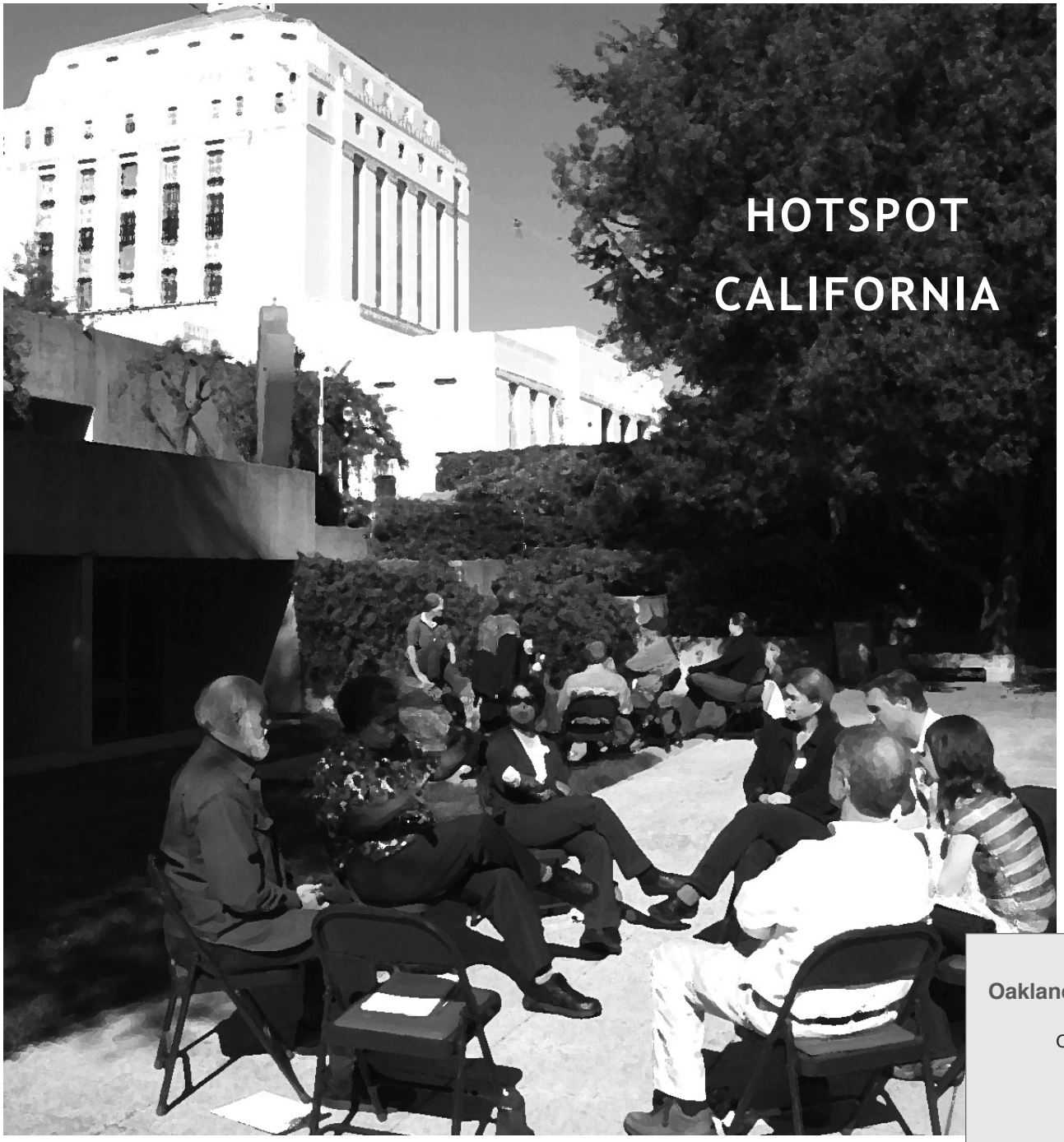

National Science Foundation Advisors Meeting

Oakland Museum of California
November 6 & 7, 2009

Oakland Museum *of* California
1000 Oak Street
Oakland, California 94607-4892

510.238.2200 telephone
www.museumca.org

This unpublished document is intended to be a faithful synthesis of the presentations and discussions at the *Hotspot California*, National Science Foundation Advisors Meeting that took place at the Oakland Museum of California on November 6 and 7, 2009. It is meant to serve as a resource for those who attended and for the Oakland Museum staff. It does not necessarily reflect the views of the Oakland Museum *of* California or individual meeting participants.

Participant comments have been paraphrased and the sequence of participant remarks have been reorganized. These are not exact quotes, rather they are an attempt to capture the content and meaning of the ideas presented.

Cover: Participants hold al fresco discussion in the museum gardens

Page number graphic: The state rock of California in the museum gardens (jade, part of the serpentinite rock and mineral family)

This meeting was made possible with a grant from
the National Science Foundation

Any opinions, findings, conclusions or recommendations expressed in this material are those of session participants and do not necessarily reflect the views of the National Science Foundation.

Participants

National Science Foundation Advisors

Doris Ash, Ph.D.
Associate Professor, Department of Education, University of California at Santa Cruz

Richard Bugbee
Associate Professor of Ethnobotany, Cuyamaca College, El Cajon, California

Christopher Cogan, Ph.D.
Assistant Professor, Environmental Science and Resource Management, California State University Channel Islands, Camarillo, California

Carolyn Finney, Ph.D.
College of Natural Resources, Department of Environmental Science, Policy and Management, University of California at Berkeley

Julie I. Johnson
John Roe Distinguished Chair of Museum Leadership, Science Museum of Minnesota

Peter Kahn, Ph.D.
Associate Professor, Department of Psychology, University of Washington, Seattle, Washington

Matt Matcuk, Ph.D.
Exhibition Development Director, The Field Museum, Chicago, Illinois

Norman L. Miller, Ph.D.
Staff Scientist and Adjunct Professor, Climate Science Department Berkeley National Laboratory, Geography Department, University of California at Berkeley

Stephen Quinn
Senior Project Manager, Exhibition Department, American Museum of Natural History

Scott Sampson, Ph.D.
Research Curator, Utah Museum of Natural History, and Adjunct Associate Professor, Department of Geology and Geophysics, University of Utah

Lisa D. White, Ph.D.
Professor of Geology & Associate Dean, College of Science & Engineering, San Francisco State University

Invited Guests

Dan Rademacher
Editorial Director, *Bay Nature* Magazine

Jennifer Stock
Education and Outreach Coordinator, Cordell Bank National Marine Sanctuary

Oakland Museum of California

Administration

Lori Fogarty
Executive Director

Natural Science Department

Carson Bell
Curatorial Specialist

Amy Billstrom
Interim Interpretive Specialist (Education)

Gail Binder
Preparator

Lindsay Dixon
Chief Preparator

Douglas Long
Chief Curator of Natural Sciences

John Perry
Exhibit Project Manager

Christopher Richard
Curator of Aquatic Biology

Carolyn Rissanen
Registrar

Mary Jo Sutton
Lead Developer/Designer

Karina White
Exhibition Developer

Education Department

Rebekah Berkov
Natural Sciences School Programs Coordinator

Susanne Pegas
Water Strider Coordinator

History Department

Louise Pubols
Chief Curator of History

Art Department

René de Guzman
Senior Curator

Docent

Cedith Copenhaver
Special Projects Associate

Project Consultants

Cecilia Garibay
Principal, Garibay Group

Catherine McEver
The Bureau of Common Sense, Documentation

Kathleen McLean
Independent Exhibitions

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Introduction

CONTEXT AND OVERARCHING PRINCIPLES

Lori Fogarty, Executive Director, OMCA

I'd like to give you a little background and context for the National Science Foundation (NSF) project here at our Natural Sciences Gallery in terms of what is happening at the museum in general. I'd like to start by thanking all of you who have participated so far with us. A number of you have been at past symposia and workshops that really informed our successful proposal to NSF. It is a $2.5 million grant, and the first NSF grant in this institution's history, in what we understand was a very competitive round.

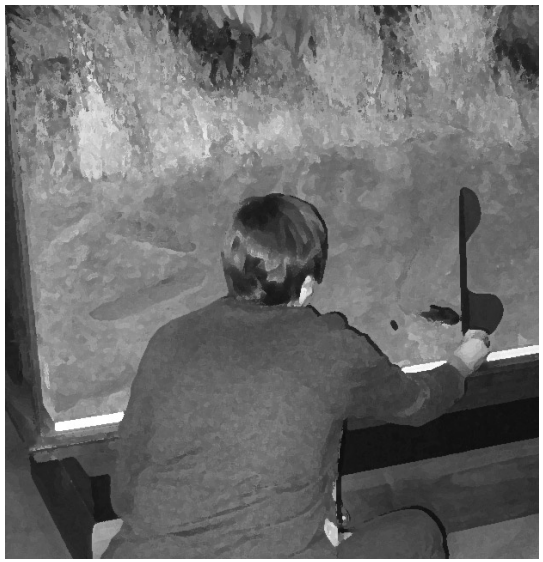
What NSF stressed in their feedback regarding the grant was the importance of the community connections and the museum's long-standing connection to community, and we will be talking more about that today. Another point was the strength of the research and evaluation portion of the project, and you will be hearing more about that from Cecilia Garibay. All of you contributed your letters of support, and if you haven't been in our past workshops, we have read what you've written and reviewed your research, all of which has contributed to getting us to where we are today.

In terms of what is happening at the museum in general, you could probably tell as you walked in this building that we are under construction. We are in the midst of an approximately $60 million capital project. The museum is closed to the public right now because we are doing work that is very intrusive on a lot of our public amenities. This is the first major renovation or capital improvement that the museum has had since it opened forty years ago.

The history of this museum dates back to three predecessor museums of art, history and natural history, dating back to the early part of the 20th century. They came together in the 1960s as a unified institution with a focus on California. The architect of this building, Kevin Roche, is still alive and is a Pritzger Prize winner, and this was his first major project. It was designed as a museum of the people. When it opened it was free, it had five different entrances, and the idea of the indoor-outdoor integration was the radical contribution Roche made to museum architecture. It was designed to be a sort of counterpoint to the grand edifice of a museum and to be really integrated into the surrounding community.

We have three collection galleries and later you'll have a chance to see our Art and History Galleries, which are being installed. Each of the three galleries is about 30,000 square

Lori Fogarty experiencing a diorama intervention



Remaining Flexible, Nimble, Changeable

• The other aspect that we are trying to deal with, which is a big challenge, is how to make these galleries flexible, changeable and nimble. In permanent collection galleries there is an emphasis on "permanent," and our galleries have not had any substantial change for four decades. We don't want to build ourselves right back into that box. We want to create these galleries as platforms for the experience of our visitors and build in enough flexibility and changeability, as well as the ability to update, so that they can evolve over time. • **Lori Fogarty**

feet, so they are enormous, and we are redoing all of the galleries. That is really the major focus of this project. We are making some architectural enhancements and infrastructure improvements, but the real focus is the complete rethinking and reinvention of the galleries. We are almost done with the first phase of the project, the Art and History Galleries, which will reopen in May. We will then go right into the architectural work and renovation of the Natural Sciences Gallery.

I will highlight a few of the things that we have been thinking about institution-wide in terms of this project. We are in Oakland, one of the most diverse cities in the country. This museum has always had a very strong community focus and a very strong education focus. I would say our overarching goal of this project is to expand, increase and diversify our audience, particularly our audience of diverse families and younger people. We want to bring in and welcome a whole new audience. That means a pretty significant rethinking of the visitor experience in our galleries and how to engage our visitors.

A lot of what we have been thinking about is the question of how to tell multiple stories of California. The great advantage that this museum has is that we are an interdisciplinary museum. We can make the connections between the natural environment, cultural history and artistic expression, so throughout all of our galleries we want to have many stories of California, multiple perspectives, and first-person voices. We are working in all three galleries with visitor contributions, visitor input and visitor comments, so it is not just the authoritarian voice of the museum but a reflection of visitors' voices.

We are working with extensive collaboration in all three of the galleries in all ways. We have community advisory councils that we are working with, and we have partnerships with various organizations. We are also doing a lot of work with prototyping and evaluation for all three galleries. For those of you in the science world that is not unusual, but in the art world it is unusual. I did an interview recently with someone from *Art News* and mentioned prototyping in the Art Gallery and they asked, "What is prototyping?"

Those are some of the overarching principles that we are working with in the galleries. We look forward to having you here and spending the next day-and-a-half with you. Douglas Long is now going to talk about the project itself.

PROJECT OVERVIEW

Douglas Long,
Chief Curator, Natural Sciences, OMCA

I was one of those kids you've seen come through your galleries, and at a very young age I got hooked on natural history museums. During high school I volunteered for the now-defunct Orange County Museum of Natural History. I worked at UC Berkeley Museum of Paleontology, and for a decade at the California Academy of Sciences.

When I moved to Oakland twenty-one years ago and first came here, I fell in love with this museum. The exhibits that they have aren't the traditional types of dioramas you've seen in most natural history museums, with the charismatic megafauna and the big dramatic backdrop. What we have here are basically cookie-cutter chunks of ecosystems that show the uncharismatic macro- and microfauna that really help run an ecosystem. I was absolutely blown away by the sheer number and diversity of species in the gallery here. At one point I actually went through and counted over 1,200 different species of native California organisms.

When the museum opened, that was revolutionary, that movement away from trying to create the dramatic sense of place or an exotic locale by using big mammals, to really trying to show you the multiple stories and interconnectivity of the organisms and all of these little habitats in California, many of which I've visited. I really love this place and am excited to be part of the transformation that we are going through.

As Lori pointed out it's not a renovation, it's really a rethinking of what a natural history museum can be and how we can provide new ways of communicating science, new ways of engaging our community, and new methods of enabling visitors to have a personalized experience in the gallery. We are focusing on developing four major sections in the gallery. It's a nice square, with the four sides each supporting the others. The first is that we are going to showcase California as one of the top ten biodiversity hotspots in the world, as defined by Conservation International. If you look at just the number of plants alone, there are over 8,300 species of vascular plants. There are more species of birds recorded in California than anywhere else. The list just goes on and on: the diversity, the abundance, the number of endemic forms are parallel to some of the more exotic places around the world. So we are going to showcase the biodiversity and by doing that, we are going to bring in scientists who will be able to show their discoveries and communicate how they are able to measure the biodiversity in California.

Also, part of what makes a hotspot are the threats that the environment is under. We are going to feature some projects like the Grinnell surveys at UC Berkeley and a number of others that have shown the shifts in ranges of species or contraction in ranges of species or habitats that are now severely endangered. That is one of the definitions of a hotspot: the biodiversity being under threat by human encroachment and other anthropogenic causes.

To do that without having a bummer story, we are going to feature a lot of the successful conservation stories that have happened in California. We are going to try to have a very careful balance of success stories but also continuing threats, leading into a sense of stewardship and what people can do. We want to offer conservation solutions as well because

Cocreation with the Community

We are also going to bring in the experiences of people in our local communities. We want to make the gallery much more relevant and accessible to them. One of the ways we're going to be doing that is through a cocreation piece. We are teaming up with the YMCA and East Bay Regional Parks to have families develop parts of the gallery based on their experiences. I find that to be very exciting as well. • **Douglas Long**

Douglas Long and Doris Ash

"Pull Content" and Web Development

We want the content to be more "pull content" than "push content." To this end we are going to be developing components in our gallery that we can put on our Web site so that those who leave the museum, as well as those who have never even been to the museum, will be able to interact with the exhibits and with the content.

• Douglas Long

California has been a pioneer in coming up with really radical ways—either politically, scientifically, ecologically or through community-based action—of dealing with the endangered habitats and species we have in California.

We are also, as Lori said, going to be very community-oriented. There are two major facets to this for our gallery. We want to bring in the voices of those people in the community, not just locally but throughout the state. Who are those people involved in conservation projects? A lot of them are not scientists, they're just plain old folks off the street. We want to be able to show that individual citizens can have a major impact on conservation. We also want to try to strike a fair balance by bringing the voices of the other stakeholders in: the ranchers, the fishermen, maybe even the ATV riders out in the desert. The also share the resources as well. I think it's important to have that balance. As a scientist I have my idea about conservation and resources but realistically, in order to forge a political alliance, there will have to be give and take and voices presented of those people whose views don't necessarily align with those of the curators.

We are going to make the gallery very visitor-oriented. We want people to be able to come in and interact with the exhibits. We want them to be able to tailor their experience in unique ways by choosing to engage or not to engage in different types of exhibits and activities in the gallery, social media, and programs that might be directly involved with components in the gallery.

At this stage these are all just great ideas. What we really need to do is further develop these and come up with some very good examples of methods of prototyping these ideas. That is one of the reasons why we have you here today, to really help us focus in on ways to achieve and realize these goals.

The Diorama Dilemma

Another very important piece is what we are calling the "diorama dilemma." We know that dioramas can be compelling ways to connect people with the environment, to connect people with animals, to connect people with ecosystems. There seem to be very diverse individual ways of making those connections. We want to tap into how dioramas can generate a sense of wonder, a sense of mystery, a sense of investigation and a sense of place. One of the things we're going to be talking about are those ways in which we can psychologically connect people with the organisms, connect people with the stories, and be able to further develop that and bring that out in a context in which we can then showcase the biodiversity, talk about the conservation stories, and instill a sense of stewardship or even ownership of the lands and the wildlife that we all share in California.

One of the ways that we are going to be doing this is to look at supplementing dioramas with technology, and we don't even know what some of those technologies are at this point. We are evolving as the technologies are evolving. We are looking at new didactic ways of bringing people into the dioramas and into the messages that they are communicating. We want to possibly use social media, to use technologies that are going to really include the visitor and make these connections more personal and provide information as people want more information.

Passion Statements

DORIS ASH

Associate Professor, Department of Education,
University of California at Santa Cruz

I'm a learning scientist and a natural scientist and may be one of the few learning scientists and natural scientists here. I do research on learning and teaching, mostly in museums and aquariums and have done that for the last fifteen to twenty years. I worked at the Exploratorium before going to UC Santa Cruz, so I have my museum chops. There are three main passions I would like to talk about:

- **Equity**
  I only do research on diversity for culturally and linguistically diverse populations. I've worked in Oakland, I work in downtown Tampa, Florida, I work at the Monterey Bay Aquarium. It's almost always with either Latino or bilingual populations or urban populations or Oakland-type populations.
- **Sociocultural Views of Teaching & Learning**
  The second piece is that I use sociocultural views of teaching and learning. I rely heavily on Vygotsky and can explain that ad nauseum if you want. I use activity theory, which I can also explain at length if you'd like. The basic tenet is that there is more than individual learning going on. There is stuff in my head, but there is also stuff in the group, and the group learns from each other, like we're doing right now.
- **Teaching and Learning Intertwined**
  The third passion is that I do not think of learning and teaching as separate, they are intertwined with each other. I don't think you can be a good teacher without understanding how learners learn and that's what I tell my students all the time.

My history is based on my research, so I'm going to go through my NSF research grants because they tell the story. My first was with Chabot Observatory, a Girls and Science grant with NSF. I was PI on that and very interested in gender issues, which fits under the equity umbrella for me. That involved after-school clubs and summer workshops with teachers.

My second grant was a Career Grant with NSF, and that was about immigrant bilingual populations at the Monterey Bay Aquarium, working with Headstart programs to try to see if you could increase the pipeline for Latino students and their families. The family was the unit of analysis rather than the student. I always work with groups. The unit of analysis for me is always a group, like a family. I use families because they're interesting, they know different things, and they need to have advancement in science as well as students for field trips, etc.. I've not done field trip research per se.

Introduction to Passion Statements

- What are you currently most excited and passionate about in your work? This will serve both as an introduction and as a way for us to move quickly to a deeper level of conversation later in the meeting.

  The strategy of using passion statements in a session of this type is something I started experimenting with at the Exploratorium. We tell people they have five minutes to tell us what they are passionate about. While this may seem like an impossible time limit, if Nobel Laureates can do it, you can do it. • **Kathleen McLean**

Doris Ash

Doris Ash and Scott Sampson

Resource

For more information on Doris Ash's research, projects and publications go to:

http://people.ucsc.edu/~dash5/

My next grant is with the Museum of Science and Industry in Tampa, Florida. It's bicoastal and I go to Florida a lot to work with them. That grew out of the Career Grant, working with bilingual families. We realized that the way docents, interactors and explainers, those I call "museum educators," teach in museums in highly idiosyncratic. Even when we taught the people ourselves and had a scaffold, in the Vygotskyan sense, for stepping in and out of the situation, they were teaching differently. I realized this was a major issue that we needed to address. I'm a learning specialist; let's look at the teaching part.

We've worked for the last four years at the Museum of Science and Industry with an urban population much like that of Oakland, which is nice because the diversity is there. We are working there with the museum educators, whom we call Museum Educator Researchers (MERs). They do research on their own practice using the teacher research model, or action research if you will, that we've used in classrooms for fifteen or twenty years now. They do a great deal of reflective practice on their own and others' teaching and learning. They look at learners. We call that "noticing." I can give you the Web site, and we do have some papers finally on this.

The other part is called "responding," which is a kind of formative assessment, or notion that in order for us to have a dialogue, you need to listen to me and respond to me, and I need to listen to you and respond to you. So it's an interaction analysis of learning and teaching. These MERs have just gone to ASTC and the Florida Association of Museums and spoken about their work, talking Vygotsky zonal proximal development, dialogue, listening to each other. Julie can attest to that, she was there. The next step, now that we've proven this success story in one site, warts and all, with all of the different problems you have in trying to implement a new way of doing things in any institution, is that we're applying to NSF again for an implementation grant to work nationally with other museums. We're taking applications for that right now. We think we're going to go locally and nationally simultaneously, with a number of sites in Florida and nationally, so we can have a semicontrolled study of near-near and far-far.

On top of that, one of the other ideas we had for that grant was to do a professional development museum, an actual site, in Tampa, Florida because that's where we did the work. We'd have an actual site where people could come visit and see the work in action and use the rubrics and metrics that we're designing for other institutions.

Another piece would be to do an implementation study on top of the implementation, to actually study the implementation itself, what works and what doesn't work, and be very visible about that and where the stresses and strains are. When you try to change an activity system it's all about stresses and strains. Everybody hears how great everything is. I think

we need to hear the other part, why it may or may not work in other institutions. We're thinking of going with something like five in Florida and five nationally. Any input you have for us is great. The grant is due in two weeks.

What do I want to get out of being here with all of you? I love to be back with scientists, natural scientists. I hang around a lot with learning and teaching folks and I'm happy to reciprocate on anything you want about teaching, about papers, etc. I have done work on dioramas by the way. I have a couple of papers on dioramas from working at the Los Angeles Museum of Natural History. They are near and dear to my heart, and I am very interested in the issue of narratives around them and the issue of the kinds of work that you can get out of dioramas as a research piece and would love to work with you on that.

The other piece I'd really like think about with you is the technology piece. I have a colleague, Angie Barton, at Michigan State University. She has great youth-centered activities and I think this place could benefit from that. There's also a great wiki of youth projects, and they can do the work for you about the hot-spots. You don't need to do it because they're so good, and you have the youth here.

Resource

Two sites regarding Angie Barton and green energy youth project:

http://ed-web2.educ.msu.edu/researchprofiles/search/profileview.asp?email=acb@msu.edu

http://itestlrc.edc.org/investigating-green-energy-technologies-city-get-city

STEPHEN QUINN

Senior Project Manager, Exhibition Department, American Museum of Natural History

I've had the great privilege of working at the American Museum of Natural History for the last thirty-five years. I was hired in 1974 through a New York State Council on the Arts grant and worked for that first year as an artist, apprenticing with the older artists who were retiring and taking some of these unique diorama skills with them. My passions go back way prior to 1974. My passions are in the natural world itself. As a child I grew up close to New York City, but in what was true wilderness. My siblings and I grew up alongside the

Resource: *Windows on Nature*

Windows on Nature: The Great Habitat Dioramas of the AMNH, Stephen Christopher Quinn, Abrams, New York, in association with the AMNH

From left: Scott Sampson, Stephen Quinn, Peter Kahn

The Connection Between Art, Nature and Dioramas

My passions really found expression through art, and I don't think that's really unusual because I think art and natural history have a really close tie when you look at people like John James Audubon, who essentially gave North America its wildlife passions by depicting birds as these wonderful works of art that they really are. And look at Roger Tory Peterson, who was not a professional ornithologist but an artist, or David Sibley, not a professional ornithologist but an artist. There is Thomas Moran, who accompanied the US Geological Surveys at the turn of the century and brought back these wonderful images of Yellowstone and the national parks. It's art that really turns our passions on, and I think dioramas and museum exhibits are in that same genre.

• Stephen Quinn

Hackensack Meadowlands. My growing up years were much like Tom Sawyer or Huckleberry Finn, roaming around the marshes and rafting through the waterways.

I was very much a nature nerd and my folks would bring us across the river to visit the American Museum of Natural History. It was at the museum, walking through those big rotundas, that I think my passions in natural history were really validated. It's there that I saw the things I cared so much for elevated to beautiful objects worthy of display and drawing great attention. You couldn't help entering the museum as if you were entering this great cathedral of science or temple to nature, which is how I really felt as a child about the natural world.

I landed at the museum, where I think I've got one of the best jobs in the world. It's a great place to work. The museum has an old tradition in developing exhibits directly from nature, going back to the source and recreating this epiphany that we have all probably experienced. I can remember being a child and crawling up a sand dune with my brother and looking over a bulkhead and seeing a Common Loon. I'll never forget that impact, that experience. I had to go home and get out a big copy of *Audubon's Birds of America* and see what a loon was on those pages. I think we all have those moments of epiphany that change us, that leave us changed. And I think natural history museums and the traditions of the American Museum attempt to do that with their exhibits. They try to recreate that personal encounter with nature, that moment that's going to turn you on to nature and keep you hooked for the rest of your life.

The work that we do at the museum in building and developing these dioramas is really a passion for those who do it. The protocol there is to actually go to the real place in nature and duplicate that actual site. They're not generalized scenes, they're a real place, and some of these go back to the 1920s and turn of the century. So you can use these exhibits as a kind of a litmus paper to go back and see the changes and document what has happened since they were built.

I work as a naturalist at the museum also and was fortunate enough to be sent up into the Virunga Volcanoes to lead a nature tour. I was so distracted getting ready for the trip and finding birds and animals for people to look at that suddenly we were up at the high altitude in the volcano, looking for Mountain Gorillas, and I had this amazing sense of déjà vu. I realized it was the Mountain Gorilla in the African Hall. Everything was just as it was in the diorama: the scene before me, the trees, the vegetation. It was such a great illusion in New York that I made that connection at that moment.

I think you are at a really exciting point and that you can do wonderful things. My own feeling is that to try and make that connection and recreate that illusion of being in the natural world is what we might all be after.

MATT MATCUK

Exhibition Development Director,
The Field Museum, Chicago, Illinois

My background is not in the natural sciences and it is not in education exactly. My undergraduate degree is in photography and then I have master's and doctoral degrees in English, with a specialization in rhetoric. In between undergraduate school and going back to graduate school, I worked in advertising for three years and wrote my dissertation on rhetoric of advertising. What I'm thinking of here is, what is the rhetoric of the diorama and how can we use or improve that rhetoric to promote conservation awareness, understanding and action?

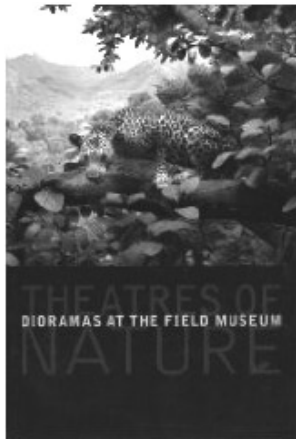
A quick recap of dioramas at The Field Museum: We've got a lot of them, eighty-five to ninety, depending on how you count, built between 1902 and 1954, with the majority created between 1912 and 1940. This means that there was a twenty-eight year span where we probably built fifty to sixty of those dioramas. Noted artists who were involved include Charles Corwin, who created backgrounds, Wilfred Osgood, curator in zoology, and Carl Akeley and Leon Pray. I visited Leon Pray's house, by the way. It's in suburban Chicago and is filled with things from his time as a taxidermist at The Field Museum. The list of notable specimen collectors is sort of fun. It includes Theodore Roosevelt, his sons Kermit and Theodore, Eleanor Roosevelt, Admiral Richard Byrd, Carl Akeley, Louis Agassiz Fuertes, and others.

We're in the preliminary planning phases right now of doing a brand new, permanent exhibition on conservation. We're trying to think of it not as an exhibition but as a sort of center. One of the major things that we are considering right now is exactly the problem that all of you are tussling with, how to work with dioramas to make them do more.

What do we know about dioramas? People like them. What we don't know: how effective they are as an educational medium, how effective they may or may not be at promoting conservation action, and how we might use contemporary technologies to enhance the traditional diorama's abilities in those two areas.

How do dioramas talk to us? Of course a study in rhetoric included Aristotle, and according to Aristotle you need to divide an argument into three types: ethos, pathos and logos. Ethos is argument based on the character of the speaker. Pathos is an argument that stirs the emotion. Logos is a logic-based argument. In our age some of the most skilled rhetoricians are in law or advertising, and of course I'm drawn to the latter. So how would an advertising agency put Aristotle to work in terms of selling conservation of our ecosystems?

Many products are sold on the basis of how well they do a particular job: chain saws, laundry detergent, computers, etc. But a really large percentage of products that are sold can't be sold on the basis of some kind of demonstrable superiority: colas, blue jeans, carpeting, lip stick. Although some of these



Resource: *Theatres of Nature*

Theatres of Nature: Dioramas at the Field Museum, Sally Metzler, Ph.D., The Field Museum, Chicago, 2007

Matt Matcuk

Exhibitions Like Advertisements

I have a final note in this presentation that says, if you think talking about theme parks or video games makes curatorial colleagues of yours nervous, try telling them you want your exhibitions to be more like advertisements. • Matt Matcuk

Matt Matcuk and Kathleen McLean

products do use advertising based on logos based argument—"this lipstick stays on longer than other brands," or "this shampoo gives your hair 33% more volume," (which is really intriguing)—you have to use a different kind of persuasion. For these products an agency would begin by analyzing a superficial need. For example, toothpaste for whiter teeth, or a sports car that can get you there more quickly.

But most of those needs are not a matter of life or death. You don't need whiter teeth to stay healthy or to survive, but in our culture people think that's beautiful. You don't need a fast car unless you're trying to get an expectant mother to the hospital or something like that. But in our culture we want these things, and we want them because they represent deeper needs. We want to be attractive, we want to be powerful, we want to be virile, and so on. So it's the advertiser's job to link their product not with the superficial benefit of whitening your teeth, but with the satisfaction of that deeper need. This product will make you feel attractive and good about yourself. This product will make you more powerful and in control and virile.

That means that advertising's rhetoric is usually based on pathos (feeling), or on ethos (the character of the speaker). Argument by ethos is a multibillion dollar industry. It takes the form of celebrity endorsements. The celebrity does not have to have anything to do with the product being sold but because of their particular attributes, the audience that is being sold that product is going to listen to them. If it's something wild and edgy, Tony Hawk will sell to your teenagers. It's feeling or pathos that forms that basis.

I'm thinking about dioramas because advertising relies on pathos, pathos relies on drama, and the best dioramas are stories. So this is about diorama drama. Why are they stories? They have a simple plot line with heroes, challenges and resolutions. They can be taken in quickly. They take us away to unique, beautiful places and times that we can't otherwise reach. I'm thinking movie or manga as I'm saying this. They can be read by different people in different ways. They reassure us and reinforce our preconceived notions by telling "enduring truths" (of course with big quotes around that phrase). Knowledge of the subject can enhance your experience of the story, but it isn't necessary. You only need logos to the extent that it helps enhance the pathos.

All of which leaves us with more questions than answers. Here are some of mine. One, what is the Oakland Museum of California strategy for employing dioramas use drama, and how can it enhance that drama in the service of a pathos based argument?

Question two relates to something Stephen was saying. We know all about charismatic megafauna at The Field Museum and our curators feel the same way: "The Water Buffalo get all the press, but I'm a mycologist and that's important too." How do dioramas currently use

the rhetorical power of ethos, which, by the way, Aristotle says is the most motivating and powerful of all three forms?

How might digital technologies be most appropriately and effectively used to enhance either of these strategies? You can see I've got an assumption embedded there, and that is that technology would not be most appropriately used to enhance a logos-based argument. A logical argument, in our case, would seek to prove that more or better educational content would help persuade people to take conservation action. I'm a Philistine, I'm a former ad guy, I don't believe that. I believe that no matter how much we try to teach people about the importance of what's there and teach them the value of it, those are not the things that will motivate people to get off their butts and do something about it.

Fourth and last, how does the move toward the personal that social networking and other technologies facilitate affect our ability to be motivated by the dioramas?

JULIE I. JOHNSON

John Roe Distinguished Chair of Museum Leadership, Science Museum of Minnesota

I started my career as a math and science middle school teacher for kids who are deaf and hearing impaired and did that for about nine years. I then went and worked at the New Jersey State Aquarium, starting as the Assistant Director of Education and working my way up to the Chief Operating Officer. After thirteen-plus years of doing that I went to NSF and worked as a Program Officer for three years. I'm now at the Science Museum of Minnesota, where I do organizational development, strategy, planning, participative processes, and coaching and mentoring.

My passion for science started in sixth grade with my dear teacher, Mr. Tindiglia. I was doing some work with teens a couple of weeks ago and as you know, they're very jaded, they're real people. They were asking me why science was important to me. I told them that in my elementary school, once a year, paper would cover the doors of the sixth-grade classroom and you'd hear laughter and screaming coming from inside and you didn't know what it was. And the sixth graders never told you what it was.

So it was really cool when I was going into the sixth grade. Now I was going to find out what happens on that special day. Mr. Tindiglia had a farm, and once a year during butchering time he'd bring in a cow's head and do a cow's head dissection. Hence the covering of the door's windows.

Resource:

"Leadership in Museums," Julie I. Johnson and Randy Roberts, *ASTC Dimensions*, November/December 2009

Julie Johnson (right) and Doris Ash

Identifying the Pitfalls

I appreciate the remark that John Perry, the Project Manager, made during the introductions when he said that this project is cool and it is scary. There is a lot of potential here and whatever works, that's great, and I know you will talk about that. But also think about what was hard and what doesn't work. I think that will be really important for the next group that tries to do something as well. • Julie Johnson

Julie Johnson (right) and Kathleen McLean

We're sitting in the class, you've got this big head up there, he's taking stuff out, and girls are going, "Oooo, oooo," and guys are going, "Ugh." But in sixth grade, girls chat. There was a group to one side chatting and Mr. Tindiglia got fed up and threw an eyeball at them, but because of the way he threw it, the eyeball got stuck on the ceiling. You can imagine how it looked with the viscous stuff around it. Well, the eyeball turned. There was squealing, but then I heard this retching sound. I turned around and it was the gym teacher throwing up. I remember this as if it were yesterday, and I was sitting there thinking, wow, that's kind of cool. He's throwing up, they're all screaming, and I'm thinking this is cool.

As you can imagine, being African American growing up in the sixties, you didn't get a lot of positive affirmation about many things. But in that moment it was like, wow, there's this adult who can't handle this, and there's this really cool teacher. I can do this, I can do science. That is where my drive for science really started.

I have a degree in biology, and I have a degree in deaf education and instructional technology, but science has always been part of what I do. Right now it's not a direct part of what I do, but I really believe in organizations that are predicated on and wanting to connect people with science. So that's where one of my deep passions lies.

Another passion is working with youth and how to transfer our individual passions about why we do what we do to these future generations and try to keep step with what connects to them. I wish we could do more cow's head dissections and throw eyeballs because I think that actually might get kids more interested.

The other thing I have a passion about is the organizations that we work for and their potential. I think in the earlier part of the twentieth century it was a little bit easier to be a museum, whether a science or art museum, because there was this attitude that, sure, it was good for museums to be around. In some respects it was much easier to be true to our missions because we didn't have to prove ourselves in the same way that we are having to do now. As we move into this stage where we have to prove ourselves in someone else's language (like the business world), we get diverted in different ways for a number of really good reasons.

But somehow we are losing our way and losing our ability for that potential, and I am really interested in figuring out how we further our potential. Partly I think that has to do with how our organizations become more like learning organizations. We spend lots of time and effort thinking about our collections, thinking about the experience with our visitors, and we don't use that same lens in thinking about the experience of our employees. My current work is really about how we do those things inside of our organizations for our staff, the ones who are committed, the ones who are doing it without external kudos. How do we turn that great

stuff we are doing externally to use internally so that it can be reconfigured and reenergized?

I decided a year ago that it was time to go back to school and am in a Ph.D. program on organizational change. I am trying to take some of my experience and thinking to think deeply about organizations and how organizations nurture themselves and become sustainable in ways that make it possible for them to become sustainable out there in a larger community. I'm very much into participative practice. I don't believe that the director is the only person in an institution that can make things happen.

I've recently written an article with a colleague that is just coming out in ASTC Dimensions in which we put this idea out there. Going forward as organizations we really need to think about how leadership activity gets distributed across an organization and how people in an organization are developed so that can actually happen in the betterment of an organization.

I still do a lot of work with youth because I think that's really important, and I'm currently trying out some new things at the science museum in terms of thinking about how we develop staff.

SCOTT SAMPSON

Research Curator, Utah Museum of Natural History, University of Utah

I'm a dinosaur paleontologist and as I've said before, I have the job that's the envy of most five-year-olds. I'm also an evolutionary biologist and an educator. Four years ago I was a tenured professor at the University of Utah in the Department of Geology and I was Chief Curator at the Museum of Natural History. I left that and ventured out in a new direction because I'm convinced that, as you all know, our planet is in a bit of a pickle at the moment and we don't have a lot of time to figure it out. I thought that spending the rest of my career naming dinosaurs and putting more graduate students through the system is not what we needed right now, so I'm off doing a number of things related to education.

What I'm really passionate about is not just reforming education but transforming it. I mean that in terms of both formal and informal education, so I think museums have a big role to play. Let my try and put my analysis into effect here. I regard the problem of sustainability, the ecological crisis, not so much as an external crisis of the environment but rather an internal crisis of consciousness and perception and mind, and that technological fixes aren't going to work. We absolutely need technological fixes, but they're a stop-gap measure, and ultimately we need to change the way we look at the world.

In particular, we need to change the

Resource

To learn more about Sampson's work, including his book, *Dinosaur Odyssey*, and the PBS television series, *Dinosaur Train*, visit:

http://www.scottsampson.net

Scott Sampson

relationship between humans and nature and more specifically, we need to change the way we perceive nature from resources to relatives. This goes to Darwin. This year, 2009, is the anniversary year of Darwin, his 200th birthday and the 150th anniversary of *The Origin of Species* on November 24. We still have yet to absorb the message of Darwin, that is, common descent of all life on earth through deep time. One hundred and fifty years later, most of us don't look out the window at trees or dogs and think of them as our relatives. We are still far away from absorbing that. Until we get that kind of perspective, I think sustainability is a dream of the future.

> "The only way you get global sustainability is with the amalgamation of local sustainabilities, and that means people caring about where they live. So ultimately this great story of everything needs to be told through places…"
>
> • Douglas Fogle, AHMACC

So how do we do that? My argument is that adults aren't going to get there. We have a world view that is based on a lifetime of experience and it is very difficult to change it late in life. It's like learning multiple new languages as an adult. Can you do it? Yes. Is it likely to happen with a large portion of the population? Absolutely not. So the way it is going to happen is through education. We need to bring kids up with a different perspective of the world so that they can go beyond where we are right now. How do we do that?

I would argue that there are a couple of major elements. We need new metaphors that go beyond the "life as machine" metaphor, and even the "web of life." I think the web of life has very serious limitations, most particularly that it is horizontal with regard to time and has no temporal dimension whatsoever. We need to bring in evolutionary types of metaphors, the "tree of life," etc. and really put those at the forefront of education and get people to think about the story. Industrialized societies are the only cultures in human history that don't have an origin story. All indigenous peoples have origin stories, and those stories anchor who they are and give their lives meaning. Sustainability isn't just about the present day, it's about recognizing where you fit into the story and therefore, what your role is going to be in the future of that story, recognizing that you have a responsibility for it. So I think teaching that origin story is going to be very important. That's the great story of everything, from the Big Bang to us, the fact that everything in this room is stardust, absolutely everything. That's a phenomenal thing. We're all unified in this single, unfolding saga.

The other part of it is place and the intimacy of place, and people aren't going to care about saving the world unless they care about their places. I think the concept of global sustainability is a complete fiction. The only way you get global sustainability is with the amalgamation of local sustainabilities, and that means people caring about where they live. So ultimately this great story of everything needs

to be told through places, and you can do it here at this museum. You can walk outside there, or go into the gallery with dioramas, and tell the story of the earth, absolutely everything, with what's in that room and help to anchor people where they live.

I think that's one of the magic things about place, that people can feel like they belong there. The "web of life" connection is only going to take you so far. Basically, the "web of life" is an extension of the machine metaphor, it's all of the little cogs and screws that keep the thing flowing smoothly. We need to go beyond that and talk about where we come from and where we're heading.

It is by integrating the idea of the grandest story of all, of where we come from, which is now our origin story that comes through cosmology and paleontology and geology and anthropology, and anchoring that big story in place. That is the magical thing that people haven't gotten to yet, and I think natural history museums can lead the way because they have the expertise in place and what's going on in place. I think being able to tell that grand saga through localities is going to be the revolutionary thing that needs to happen in education in general.

I look forward to this process and I think we need to reinvent the natural history museum as well along the way, and you folks can have a great role in helping to do that. I look forward to playing a small part.

DAN RADEMACHER

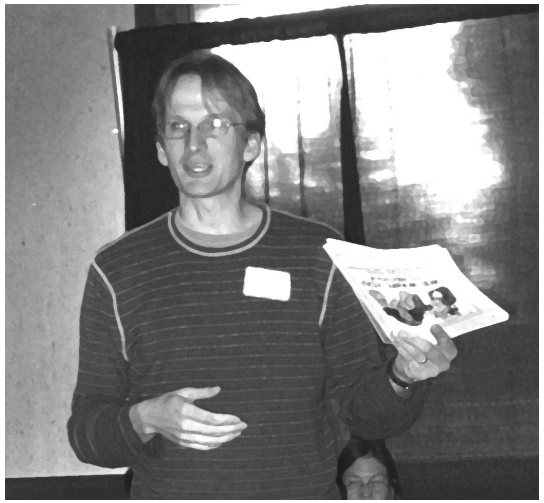
Editorial Director, *Bay Nature* Magazine

I'm Editorial Director of Bay Nature Institute and we publish this magazine, which is all about the Bay Area. We also do occasional special publications like one about climate change and its impact in the Bay Area. We're all about trying to inspire people to love and know about and listen to this great place we live in.

We have published a local nature magazine for almost ten years, and recently we've also started doing outdoor guided events. We do about a dozen per year. We do a series of public television spots about nature in the Bay Area, and we relaunched our Web site last year to be a really comprehensive portal to nature in the Bay Area.

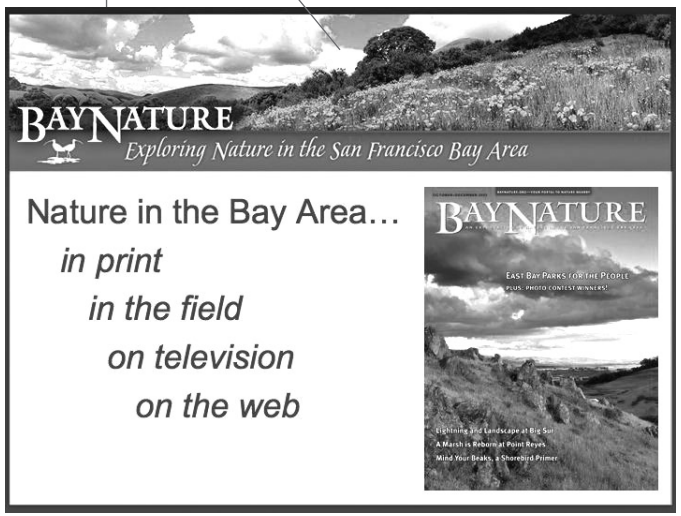
When I tell people I work for an environmental magazine, they tend to think of what I call *Toxic Sludge Quarterly*, in which you hear about awful things. It's important for people to know about that, but we want to inspire people about the beauty of the natural world and if we can't do that in the Bay Area, where can we do it? We also want to inspire people with the dozens of organizations and hundreds of people who are working on the ground, trying to restore and protect this place that we live in. So that is what we are all about. It's not about guilting people

Dan Rademacher



http://www.baynature.com

This is Coyote Hills down in Fremont, and it's the winning photo in a contest we did through Flickr, drawing in seventy people that we'd never worked with before.



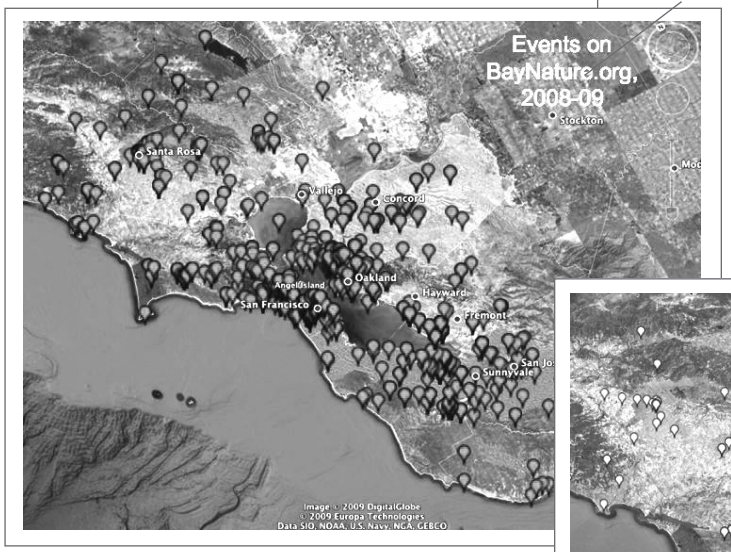
Our Web site has an interactive map, we've got articles, we've got videos. Organizations submit their nature restoration volunteer events, talks, whatever, and you can find those on our Web site.

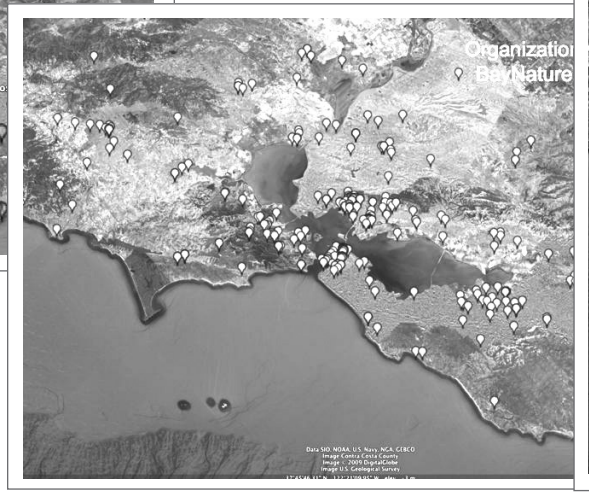
into that with a bummer story, as Doug Long referred to earlier.

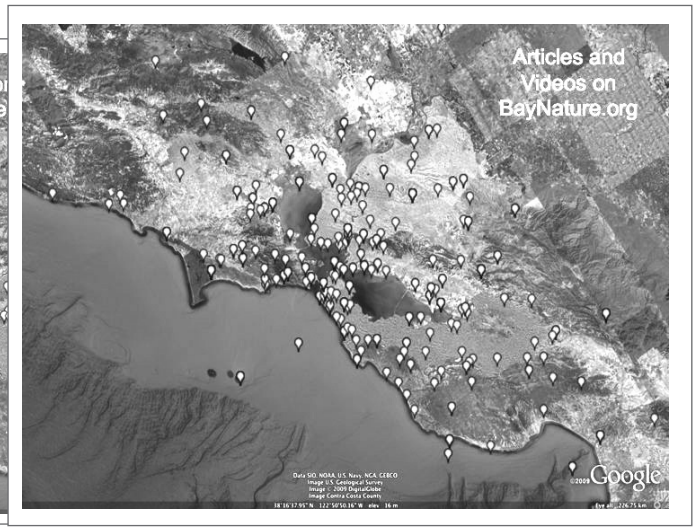
Just to give you a sense, these are specifically nature-related, outdoor or lecture events and other indoor events over the last fifteen months that have been on our Web site and that people have been able to find out about. We sort of knew this anecdotally over ten years of doing the magazine, but having all of these mappable points lets you really see it. You can look at Oakland, it's just covered with activity. There are people everywhere working on stream restorations, bay restorations, bird counts, and it's not necessarily just the people you'd expect to be doing this. North Richmond has one of the most comprehensive shoreline education programs and restoration activities going on in the Bay Area.

These [below middle] are some of the different organizations on our Web site: grass roots, museums, all kinds of organizations working on nature education and nature restoration in the Bay Area. And finally [below right], all of the articles that we've done. We really try, over time, to build up this rich place-based archive of events and articles and videos.

My wife works at Chabot Space and Science



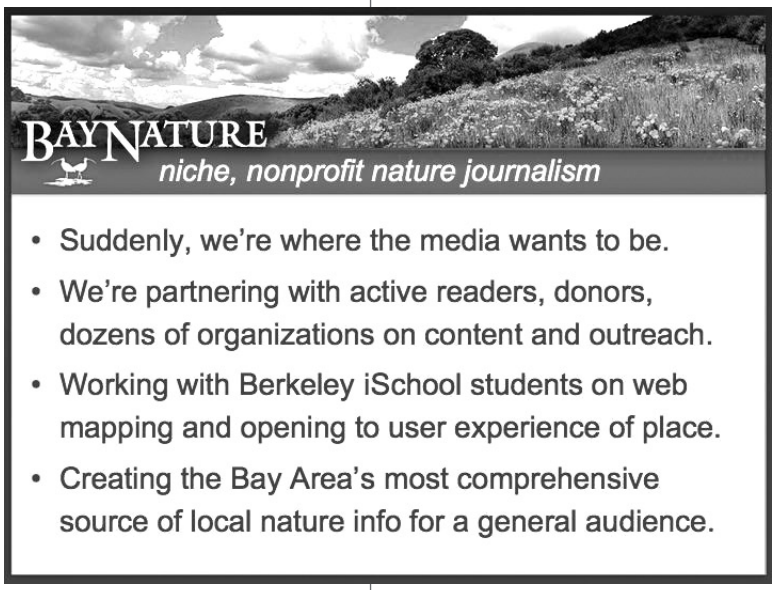




Center, which is an astronomy-based science center up the hill, so I get a lot of museum stuff from that direction, but I don't have any professional connection to museums. I actually come from a journalism background. I think museums and journalism are struggling with some of the same issues. It's not the curator, it's the journalist. We at *Bay Nature* are still trying to figure that out. How do we bring in our readers and audience members and the diversity of that audience and bring in their stories?

We're doing that more and more online. I think for us that's where the future lies. We're working with some graduate students from the School of Information at Cal to try to do some focus groups to figure out how people are using technology to find out about specific places to go and learn or spend their time. How are they using technology to document those experiences? Are they using it? I would like to expand our online mapping to include documentation of what people see out in the natural world in the Bay Area, their stories. But before I build a system that does that, I want to make sure that people are actually using that technology and interested in our doing it or plugging into ways that they're already doing it.

Generally, what I'm passionate about is trying to create the Bay Area's most comprehensive source of local nature information for a general audience. So I'm really excited to see in particular what the Bay Area section of the Hotspots galleries has and how that experience here can plug into all of these organizations that we're already plugged into. The final challenge, I guess, is that we always say. We want to do the best magazine possible, but we don't want it to be so good that you don't want to go outside. I think that's also a challenge for the museum experience. How do you inspire people to go out into the natural world with an indoor experience?



PETER KAHN

Associate Professor, Department of Psychology,
University of Washington, Seattle, WA

Technological Nature:
Adaptation
and the Future of Human Life

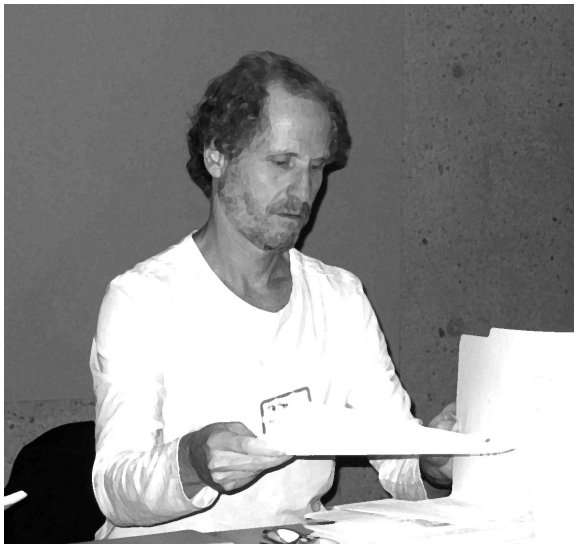
Peter H. Kahn, Jr.
Human Interaction with Nature and Technological Systems Lab (HINTS Lab)
Department of Psychology, University of Washington

"Hotspot California"
NSF Advisory Board Meeting
Nov. 6 & 7, 2009

I think two world trends are powerfully reshaping human existence. One is the degradation, if not destruction, of large parts of the natural world. All of us are recognizing that. Another, that some of you have been talking about, is this unprecedented technological development, especially in terms of our computational sophistication, and the pervasiveness of it in our lives. I think we'll adapt to such changes. How could we not? We either adapt or we die, so I think we will adapt, but in the process of adapting will it impoverish our lives? That's the question that I've been asking.

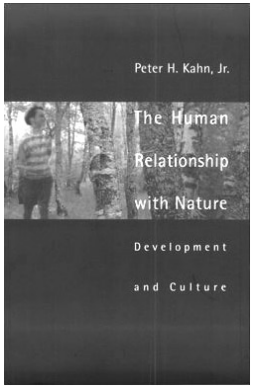
To get traction on this question empirically, over the last eight years I've been focusing on what I call "technological nature." That is technologies that in various ways mediate, augment or simulate the natural world. This body of research builds on my earlier cross-cultural developmental research on the human relationship with nature. I put some of that together in my 1999 book, *The Human Relationship with Nature: Development and Culture*, and then in 2002, with Stephen Kellert, the volume *Children and Nature*.

My research on technological nature has employed different forms of technology. One has involved the real-time display of nature on plasma screens. Here's where we

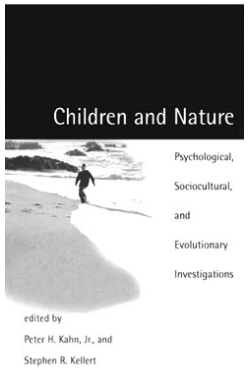


Peter Kahn

created a real-time plasma nature window. We investigated the investigated the physiological and psychological effects of viewing nature through a plasma window, and we compared it to the exact same view in real time of the



The Human Relationship with Nature
MIT Press (1999)



Children and Nature
MIT Press (2002)

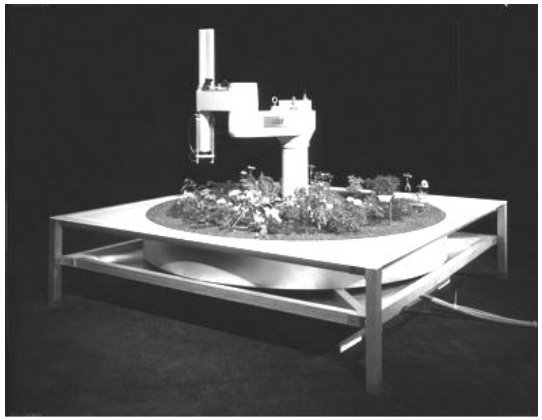
A Plasma Display Window?
The Experimental Study

Kahn, P. H., Jr., Friedman, B., Gill, B., Hagman, J., Severson, R. L., Freier, N. G., Feldman, E. N., Carrère, S., & Stolyar, A. (2008). A Plasma Display Window? – The Shifting Baseline Problem in a Technologically-Mediated Natural World. Journal of Environmental Psychology, 28(2), 192-199.

actual window, and then we also had a third control condition of a blank wall.

Another study we investigated was the psychological effects of gardening in a telegarden. This was an actual garden that was in Austria, where you could plant seeds and grow plants by controlling a robotic arm from your Web-based browser. This is Ken Goldberg and others work from UC Berkeley.

The Telegarden Study



Kahn, P. H., Jr., Friedman, B., Alexander, I. S., Freier, N. G., & Collett, S. L. (2005). The distant gardener: What conversations in the Telegarden reveal about human-telerobotic interaction. Proceedings of the 14th International Workshop on Robot and Human Interactive Communication (RO-MAN '05) (pp. 13-18). Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE).

The Telegarden. Co-directors: Ken Goldberg & Joseph Santarromana. Project team: George Bekey, Steven Gentner, Rosemary Morris, Carl Sutter, Jeff Wiegley, Erich Berger. (Photo by Robert Wedemeyer.)

We also investigated the psychological effects of interacting with robot pets. This is across four different studies and across the lifespan, from young kids to the elderly. In a seven-second video clip you can see how the child is flinching away when the robot dog makes a sudden movement. It's not unlike what would happen if you were meeting a dog for the first time.

Here's another video clip of a child playing with the robot dog for the first time. Notice how the boy is offering verbal directives to the robot dog. He says, "Kick the ball," and it would seem like the child believes that the robot dog is the sort of entity that can understand directives and then respond accordingly.

Robotic Pets in the Lives of Preschool Children

Kahn, P. H., Jr., Friedman, B., Perez-Granados, D. R., & Freier, N. G. (2006). Robotic pets in the lives of preschool children. Interaction Studies: Social Behavior and Communication in Biological and Artificial Systems, 7, 405-436.

This is actual data from some of our studies, so this is pulled from what we would be studying and analyzing.

I'm concerned about the ramifications of robot animals come to substitute for interactions with biological animals. I'm also concerned about the ramifications of robot people come to substitute for interactions with biological people.

Robotic Pets in the Lives of Preschool Children

Kahn, P. H., Jr., Friedman, B., Perez-Granados, D. R., & Freier, N. G. (2006). Robotic pets in the lives of preschool children. Interaction Studies: Social Behavior and Communication in Biological and Artificial Systems, 7, 405-436.

Humanoid Robot Interacting with Teenager

Video data from a current study with 90 participants. Research question: Can children have social and moral relationships with personified computation?

Video clip: The robot at the end of the table asks for a hug and the woman on the left responds by getting up and hugging the robot.

Contact Information

Email: pkahn@uw.edu

Academic website:
http://faculty.washington.edu/pkahn/

HINTS Lab Website:
http://depts.washington.edu/hints

Here is a couple of seconds of video footage from one of my recent studies, and this is tied to human-robot interaction. I currently have a million-dollar grant from NSF to pursue this research to focus on the social and moral implications of human-robot interactions. That builds on a larger grant that I just finished up in roughly the same area.

I think the world we are moving to is one where we'll have social and even in some ways moral relationships with robots in the future, but for me robots are just an instantiation of this larger space of personified computation. I'm concerned about that, so I'm trying to say something about the authenticity of human-human nature interaction and human-nature interaction in contrast to human-technological interaction or technologically mediated forms of nature.

In conclusion I'll note two other large ideas that I'm passionate about and have been writing about. One is the problem of environmental generational amnesia. As I see it, it's a problem that across generations we're shifting the baseline downward of what counts as healthy and flourishing natural environments. Suzanne and I were talking about that this morning, and I think it would be an exciting construct to be able to get into some of the exhibits here because I think everything is in place to have this happen.

The other large idea is the importance of wildness in human lives. I believe that engaging in the wild is a part of our evolutionary heritage and the need for wildness still lies within the architecture of our minds and bodies.

The Importance of Wildness in Human Lives

Kahn, P. H., Jr. (2009). Cohabitating with the wild. Ecopsychology, 1, 38-46.

Kahn, P. H., Jr. (2007). The child who would be caged. Children, Youth and Environments, 17(4), 255-266.

Kahn, P. H., Jr. (2007). The child's environmental amnesia – It's ours. Children, Youth and Environments, 17(2), 199-207.

Environmental Generational Amnesia

Downtown Houston

Kahn, P. H., Jr., & Friedman, B. (1995). Environmental views and values of children in an inner-city Black community. Child Development, 66, 1403-1417.

Kahn, P. H., Jr. (2002). Children's affiliations with nature: Structure, development, and the problem of environmental generational amnesia. In P. H. Kahn, Jr. & S. R. Kellert (Eds.), Children and nature: Psychological, sociocultural, and evolutionary investigations (pp. 93-116). Cambridge, MA: MIT Press.

RICHARD BUGBEE

Associate Professor of Ethnobotany, Cuyamaca College, El Cajon, California

I work with plants, I work with language. I've been learning the Kumeyaay language and I always have to tell the elders I don't speak the language very well. I live in Topanga, California, which is in the woods out by the ocean and work in San Diego with the different reservations in San Diego. San Diego has eighteen different reservations. I am Luiseno. My people are Indians from Northern San Diego county and my family is from a place with a name that means "water." My teacher is Kumeyaay, from a place that means "sweet water."

My teacher is Jane Dumas. Her mom was the last medicine woman in Southern California, so she has passed this information on to me. We have been working together since the 1980s. When I first met her, all of her knowledge is in Kumeyaay, so when she talked about plants and stuff, no one knew what she was talking about. What I did was go back to school and take all of the botany courses I could. I had worked for the Museum of Man for about seven years, so when I went back to school and took the botany courses I thought I knew a lot about archeology and anthropology. I found out I knew a whole lot about archeologists and anthropologists.

I ended up taking all of these courses and learned all the scientific names of the plants and I was able to relate what she was talking about. I learned these scientific names because I thought those were the names that never change. I found out that they change all the time, and the names that never change are the Indian names.

I started working for Kumeyaay Community College, teaching botany there on the Sycuan Reservation. The first plant I wanted to know about was the sycuan plant. All I knew was that it had four yellow petals and grew real short. I ended up finding out what plant that was, a *Cammisonia bistorta*. I let the tribe know what their name meant because on their emblem they have a California poppy. Every time I say the sycuan has four flat yellow petals, I look at the emblem and see orange petals. It's the wrong plant up there.

I work for Advocates for Indigenous California Language Survival (AICLS). We set up master apprentice teams throughout California. Out of the hundred or so languages, at least fifty of them are really endangered. Actually all of them are endangered because if you don't have any young people speaking the language, it's endangered. Some have a lot of people speaking the language, but they're all elders, so we need to get people speaking. Our master apprentice teams have produced several apprentices that are now fluent in the language. We also mentor other teams and pilot programs. When the master speaker speaks a language, sometimes he doesn't know how to teach it, so we give him a little teaching course.

Richard Bugbee

That work has been going on since 1992 and we've had speakers come out of over eighty tribes. We have a program for tribes that have no speaker left at UC Berkeley that we do once every two years. We bring speakers up and they get a crash linguistic course for a week and then spend another week studying their language. A lot of times that's the first time that language has been spoken in hundreds of years.

> "One of the things I work a lot with is plants and ethnobotany, which is plant uses, but I work more with our inner relationship with plants. Some people call it plant management, but I call it plant relationships because we don't just manage the plants, the plants manage us."
>
> • Richard Bugbee

Right now I'm working on a place name project in San Diego County, where we're going to find the aboriginal names of different places in the county. My goal in that project is for the young people to find a sense of place so that they will know where they come from. All the tribes in San Diego lost all of their beach front property, and they've been pushed into the rocks and pushed into the mountains. I took a group of kids to the beach and it was like real alien to them and I told them, "This is where your ancestors come from." Actually, they have started surf camps and different things that the kids can go to for summer programs.

I've done a summer program at Viejas Reservation for the past eighteen years and I've watched the kids grow from little to big and have watched the kids with their language programs. The language is coming back.

I spent twenty-five years learning plants from a lot of elders, mainly Jane. For the last four years I've been spending all of my time learning the language. After I learned the language I knew so much more about the way people think and how to think about things. One thing, in our language we have no word for "wild." There is no such thing as wild because we are part of the wild. In the Kumeyaay language there are a lot of Spanish loan words, so "wild" in Kumeyaay is *hentil*, which comes from the Spanish word. The same with left and right. *Kwahan* means the right way, the correct way. So the language tells me a lot. I also can eavesdrop on elders when they are talking. The first time I eavesdropped I heard an elder say, "I don't like it that they're learning the language. They might understand what we're talking about." Learning the language has opened up a lot of things. I found out if I ask elders in the language about a plant, they're more likely to tell me a lot of information.

We had an anthropologist, Florence Shipek, who worked with the Kumeyaay all her life pretty much. I got her field notes and I noticed that a lot of her notes have descriptions of plants or warnings to stay away from a plant. I'm trying to get it all together so that especially Indian people have a sense of place and belong. There was a long time

where Indian people didn't feel connected to anything except the reservation, which was a very dismal place at that time. Since, it's not that way.

Scott was talking about how we are all related. When we grow up, we've got something called "shwq," which is our clan. I was real disappointed when I found my clan because I wanted eagle or bear. We ended up being Keengish. Keengish is a ground squirrel. I met another Keengish and he has cheeks just like me. Then I found out it wasn't a bad thing because we were in charge of the acorns.

One of the things I work a lot with is plants and ethnobotany, which is plant uses, but I work more with our inner relationship with plants. Some people call it plant management, but I call it plant relationships because we don't just manage the plants, the plants manage us.

I did a little exhibit at UCSD, and in the exhibit I was talking about how people need plants and plants need people. In San Diego we have the chaparral community, and what's happened is that we used to open up the meadows and the grasslands and keep the chaparral burnt back, but that hasn't happened for the last 500 years and chaparral has taken over the whole county. So plants need the people to interact with them too. I wanted to call the exhibit, "People Need Plants and Plants Need People," so I asked my elder, "How would you say that in Kumeyaay?" She said, "Aayha shewiiw tiipay u mat nyakwaay chuur." And I thought, well she didn't even say anything about plants.

What she said was, "The creator looks out for us all and takes care of the land and the people." That's the way she translated it. Now every time I try to think of how to say something I think, how would the elders say it?

I practice on my dog. My dog speaks no English at all. When my grandkids come over I have to tell them the Kumeyaay commands or the dog will jump all over them. So my grandkids know at least how to say "Stay."

That's another thing we try to do, get these little kids talking, and they get the language right away. It's the adults who have a problem. I started learning the language when I was fifty, so it takes a long time to get there. But I would like to see the language incorporated into the exhibit too. When I worked for the Museum of Man, I had a chance to work with the elders and put the language into the audio and it just stuck with me. I'd just like to see language in the thing.

Richard Bugbee

Neshkinukat: We Are All Related

What would my elder want? She would want the language in the exhibit. We also have a word, *neshkinukat*, and *neshkinukat* means "we're all related." We have this division of wilderness and people and the idea that we have to get people back to the wilderness. Well, that's impossible because we're part of the wilderness, if there is a wilderness. We're part of the environment, we're not separate, so there's no getting back to it. I guess it's more of a realization than the actual physical thing, and I'd just like to see us getting back to where we're from. • **Richard Bugbee**

Dinosaurs and AMNH

First I've got to shout out. I loved dinosaurs as a kid, more than my brothers, so I was a little Black girl who loved dinosaurs, which was kind of strange. Second, I'm from New York and while I've seen many museums in the world, my favorite is the American Museum of Natural History. • **Carolyn Finney**

Carolyn Finney

CAROLYN FINNEY

College of Natural Resources, Department of Environmental Science, Policy & Management, University of California at Berkeley

I'm a geographer at UC Berkeley, just beginning my third year in Environmental Science, Policy & Management. Regarding my passions, I'd like to tell a little story or two so you understand how I think and who I am. My passion is people. I love people and people's stories and the idea that we can and we should be finding value in everyone's story and that everybody has a story to tell. It's not just anecdotal because there is some real knowledge there—you really don't want this to be a hierarchy of knowledge reflecting only what we think is important. I think we have to really be paying attention now. As somebody said earlier, why waste any more time? Well, we shouldn't have been wasting time in the first place. But now we're here and we have to learn how to listen and see differently. I feel very strongly about that.

The primary reason I feel this way has to do with my personal story. I am originally from New York. I was born in Manhattan. My parents are African Americans who grew up in a small town in Virginia and have a twelfth-grade education. When my father came back from the Korean War he was looking for a job, so they decided to move north like a lot of Black folks did in the fifties. He had two options. He could be a janitor in Syracuse or he could take care of a very wealthy estate about half an hour outside the city.

The Tishmans owned a big building in the city, and I grew up on their estate. My parents cared for that estate for fifty years. It's about thirteen acres: apple trees, fruit trees, a pond with fish, all kinds of interesting wildlife. My parents thought they couldn't have kids so they adopted me. Then they relaxed—and had two boys. We were the only Black family in what is a very wealthy neighborhood. For example, Harry Winston owns land in that neighborhood, and we lived next to the family that owns Schaefer beer. This was in the late fifties, sixties, seventies, eighties. My parents left there in the late nineties, so they were there a really long time.

Living here was my introduction to the natural environment. It was like having our own park because the Tishmans only came up on weekends and holidays so my brothers and I had the run of the property. My father was the gardener and the chauffeur and my mother was the housekeeper. They knew everything about that property. They could tell you why trees died, they understood the changing wildlife over time on that property.

My brothers and I had crazy games. The driveway was really long and winding and we'd call it the piranha river. We'd climb on the rocks and I'd hide a stuffed animal out there and we'd have to go searching for the stuffed animal. In the sixties I saw the movie *Krakatoa, East of Java*, about the volcano, and I was scared to death for a very long time—my

parents had to work hard to convince me that there were no volcanoes in Mamaroneck, New York.

I also remember when I was nine and was walking home from school one day with my little afro and my little glasses and I think looking pretty harmless. I was stopped by a cop for the first time—he wanted to know where I was going. I told him and he asked, "Oh, do you work there?"

I said, "No, I live there." I was nine. It was a beautiful place, a beautiful natural environment, but it wasn't natural for me or my family to be there. This was the first time I became conscious of this fact.

I think a lot about the issue of ownership because of my parents' experience on that property. They cared for that property for fifty years and knew that property better than anybody else. About ten years ago or so, Mrs. Tishman died (Mr. Tishman had passed away many years earlier). Before she died, she knew she had to sell the property and relocate my parents. There was the gardener's cottage (where my family lived) and the "big" house (where the Tishmans stayed). To Mrs. Tishman's credit, she tried to break up the property so my parents could stay there. But her children, who were adults at that time, said no, so my parents had to leave that property. They couldn't afford to stay in New York, so they eventually moved back to Virginia because my youngest brother is there.

For the last five or six years my parents have been pretty depressed. They have a beautiful house, which is all theirs. But they have only about half an acre of land. My mother says my father dreams about New York every night. That property, that land was their home and they had a relationship with that place that reflects all the sweat, blood and love that they poured into caring for that land. But that type of ownership doesn't trump a legal document.

I think about what that means for so many people because I think everybody's got a story. We hear people saying all the time that humans have lost their relationship with nature. But I don't believe this—as long as we're still breathing, we've got a relationship. I think it's our work to listen to what people have to say and make space for their stories about that relationship.

Like others in this room, I didn't get to this point in my life via a direct route. I worked about eleven years professionally as an actor in New York and Los Angeles. So I'm really interested in the relationship between the arts and the social and natural sciences. I believe that anybody can access the arts—you don't have to have any special skills. Within academic institutions, I find it challenging the degree to which people seem afraid to have that conversation and therefore diminish the art/science relationship, which I believe has the potential to be an important, generative relationship.

My favorite place in the world is Nepal. I spent

Carolyn Finney

> ...I think everybody's got a story. We hear people saying all the time that humans have lost their relationship with nature. But I don't believe this—as long as we're still breathing, we've got a relationship. I think it's our work to listen to what people have to say and make space for their stories about that relationship. • Carolyn Finney

a number of years there off and on, doing work on gender, conservation and natural resource management.

For my doctorate I wanted to explore the relationship between race and the environment. So I focused on the collective and individual experiences of African Americans and the environment and interviewed African Americans across the United States. I tell people I don't do environmental justice. The reason I say that is because the minute I say "race and environment," people assume it has got to be EJ. For me, that's just one perspective. People are more than the bad things that happen to them. I'm interested in the "more-than" and the creativity that's found there.

The other thing I want to talk about is the power of memory. A few years ago I was writing my dissertation in Atlanta and got my parents to come down and visit me, which was a feat in and of itself. One of the special places to visit is the Martin Luther King National Park. In the space of a few blocks you've got Martin Luther King's house, the Ebenezer Baptist Church and a visitor center with some really interesting dioramas. The dioramas are set up to give the visitor a feeling of what it was like to live in that era in this place—there are images of the Civil Rights Movement, Martin Luther King's voice overhead, and they've even replicated the jail cell where Dr. King had spent some time.

My father, who is a very traditional, old fashioned man, who doesn't show emotions because that's not what men do, was standing next to me in front of one of the dioramas. There was a replica of a sign that said, "For Whites Only." My father grabbed my arm, and this was something he didn't do. I thought he had a heart attack because it was so startling for me. Then he laughed really nervously. I asked, "What's wrong?"

He said, "I looked at that sign, and for a moment I thought we're not supposed to be here." This was 2006. This experience really brought to my attention the power that memory has to define for people their personal relationships with place—where they feel they can be, where they feel they can go and what they feel they can do in a place. Memories are a part of a person's story. And a person's stories reveal so much about how a person moves in this world.

I was really excited to be invited on this project—in large part because of the arts component. I love the arts and I love museums, and up to now, the only experience I've had with museums is as a visitor. But I believe that we have to include people's stories. It's not just about showing people that they have a relationship with a place because I think they already know that. I believe it's just recovering that knowledge and paying attention; not using the stories as "added value," but recognizing them as an actual and integral part of the whole. The stories and the people who live them are what makes this place what it is.

LISA D. WHITE

Professor of Geology & Associate Dean,
College of Science & Engineering,
San Francisco State University

Like many of you, I share strong passions for science, for museums, and for art. I'm a native San Franciscan and I grew up in the city in the avenues, right near Golden Gate Park, and I would frequently go to the California Academy of Sciences. I was your classic urbanite, and my parents are very educated and alumni of San Francisco State, as am I and half my family. I was so engaged in many of the exhibits at the California Academy of Sciences as a child that I didn't even realize I was so interested in geoscience until I was an undergraduate at San Francisco State.

I think there was a ten-year period where it was hard for me to connect to that passion for whatever reason. Maybe it was just growing up in San Francisco in the sixties and seventies when there was so much going on and a peer group that wasn't exactly interested in science. It wasn't until I was in an environment surrounded by scientists, professors and other students, who were so excited about what was that they did and researched, that I wanted to always feel that way too.

I make it part of my profession now to try to really engage urban youth in the natural sciences in a way that's sustainable and makes them want to be scientists as well. SF-ROCKS is a program that I direct at San Francisco State that partners with high schools in the area to try to encourage that interest in earth science.

Before telling you more about that program I'll tell you a little bit about my background and why I am here. I was sort of an unlikely candidate to be a geologist. It really was a combination of excellent teaching, a great learning environment, and a research experience as an undergraduate. I feel strongly about the role of partnering youth, whether they be college students or younger, and particularly high school students, with teams of individuals conducting scientific studies indoors, outside, in labs, in the field, in places where we can really excite them about what we do.

My first major when I was an undergraduate was photography. I was very much interested in the visual arts and still had this budding interest in science that hadn't quite emerged yet. For me, the geosciences were such a wonderful combination of the visual power of what it is that you observe when you're doing your work in addition to the critical thinking and interpretation that goes along with being a scientist.

I was really fortunate as an undergrad to have a research experience at the U.S. Geological Survey in Menlo Park. They took the whole team of us, and most of us were urban youth, to Alaska one summer to participate in a mapping project. That really did it for me and it allowed me to feel like I could be comfortable in those kinds of settings, and that they were really comfortable learning

SF ROCKS

http://sf-rocks.sfsu.edu

Lisa White

SF-ROCKS

environments and I was contributing to a larger story of why it is that we do the work that we do.

What I'm most passionate about in being a member of this team is that I think we continue to not tap urban youth in a way that sustains them, sustains their interests and sustains their perception that they too can be professional natural scientists, whatever that may be—a geologist, a geographer, a biologist. I think the Oakland Museum is so well positioned to better draw in Black and Latino and Native American youth in particular in a way that could maintain their interest and get them connected with teams of people that we know are doing remarkable kinds of research here in the Bay Area, and really fueling that so that we're all a little more synergistic in the kinds of things that we're doing.

Currently I'm Associate Dean of our College of Science & Engineering at SF State, and my colleagues tease me that I've gone over to the dark side of administration, but I continue to teach undergraduates. For the last six years I've been directing a program called SF-ROCKS, reaching out to communities and kids with science in San Francisco. We have funds from NSF and also NOAA, and our most recent grant is to support research trips to national park settings in the West as a way to introduce an urban high school population to the natural world in such a beautiful place that you're bound to make an impression on them. What I'm most excited about with this project is that it's allowing me to collaborate with some other universities out of state.

Before I became an administrator, I made sure I took one last sabbatical before it was going to be a twelve-month, eight-to-five, having to be on campus for the summer. In 2005 I spent a semester at the University of New Orleans and it just happened to be the semester before Katrina, so I was able to experience New Orleans before that transformational event. I came to really appreciate one of the programs that the University of New Orleans perfected.

For more than thirty years they've been taking New Orleans high school students to national parks in the West for these guided trips, mostly emphasizing the geologic setting of these parks. But they had a hidden agenda also, which was to create an opportunity where students felt more comfortable in a setting that might initially feel unfamiliar to them. With the right kind of support and exciting topics being discussed, you plant the seed for making students more interested in a field that might have been totally foreign to them previous to that.

Prior to my sabbatical at the University of New Orleans, I joined the group in the field and brought some high school students from San Francisco. The kinds of interactions that happened were truly priceless, to see these urban school students after a day or two finally relax and be able to connect a little more with the natural environment.

So now we have some funding to support this kind of research that we feel, especially in this post-Katrina time for the Gulf Coast community, has been a really good way to reconnect with some of the youth and their families that were so displaced after Katrina. Prior to this NSF grant, SF-ROCKS was based here in the Bay Area and mostly in the city, working with some public high schools and San Francisco Unified School District. The new project extends involvement to the University of New Orleans as well as the University of Texas at El Paso and Purdue University, and will be bringing African American, Native American and Latino American youth to some of the beautiful national parks in the West as a way to get students excited about the geosciences. There are lots of extensions to all of this, some of which will connect to the kind of museum work that's going on in a lot of those places.

NORMAN L. MILLER

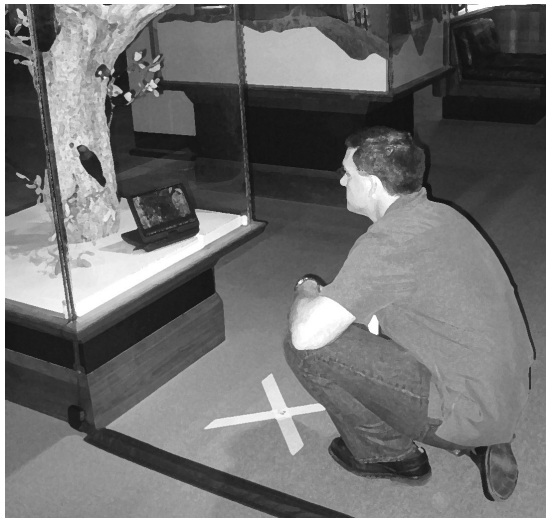
Staff Scientist and Adjunct Professor, Climate Science Department, Berkeley National Laboratory; Geography Department, University of California at Berkeley

I'll start with a little bit about myself. When I was really young I wrote a lot of poetry and oddly enough, one of the things that I wrote about was growing up to become a theoretical naturalist. When I was about sixteen I was caught in a storm. I was climbing in Wyoming and had bivouacked overnight, and I knew where I was going to go in life and that was to study climate and weather phenomena because it was just so overpowering to me that I realized this was really the direction I wanted to go. After a short undergraduate stint in mathematics and philosophy, I took off and got a very quick Ph.D. in cloud physics.

Here I am now in Berkeley in the Geography Department, teaching all kinds of interesting things, running global climate simulations and regional climate models and contributing to the California Climate Assessments. One of the important things that I was going to try to emphasize is that the work that I've been doing really is bringing in the next generation. It's all about the next generation because as we get old, we just become a little bit of a talking head.

What I've done that I think was really important was that in 1999 we put out the *California Climate Impacts Report*, knocked on state legislators' doors, and to this day

Scott Sampson with woodpecker in the OMCA Natural Sciences Gallery



Over the Rainbow

Do you know how the colors in a rainbow work? It's very simple: ROYGBIV (red, orange, yellow, green blue, indigo, violet). Every year at Halloween I explain how it works and go as "Somewhere Over the Rainbow" by painting the colors on my shoes. • **Norman Miller**

they say that was their watershed moment for passage of the California climate change bill. They said that in September at the last California Climate Change meeting. This was work with Chris Field, myself, Pam Matson, and two others.

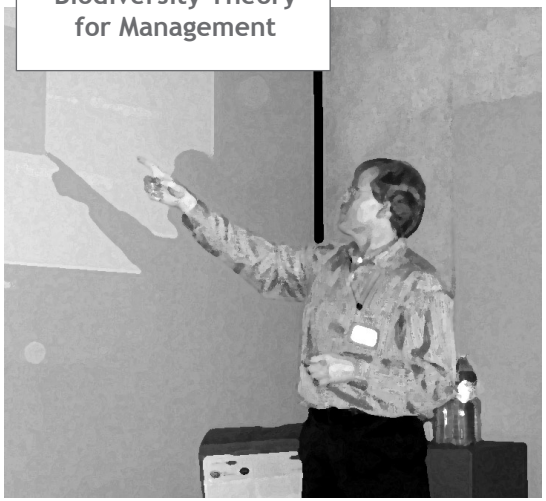
The work that I've been doing now took me down to Antarctica a few months ago with sixty undergraduates, trying to create next-generation movers and shakers to make change for the better of mankind. By the way, it was led by Robert Swan, who walked to the South and North Poles. We went by ship from Tierra del Fuego and camped out. So those are the kinds of things that I've been up to.

My biggest passion in life is watching undergraduate and graduate students' eyes light up when they connect the dots between two theoretical concepts. One example is when I explained how clouds really form and lightning triggers within a cloud and how we get thunderstorms. This is something that people would see but they never really understood, and they looked at it now in a totally different way. Understanding these natural phenomena and how they transcend through daily life—as a sailor (which I do a lot), or a mountaineer—really gives you a different perspective. To bring that here is something that I hope to provide.

CHRISTOPHER COGAN

Assistant Professor, Environmental Science and Resource Management, California State University Channel Island, Camarillo, CA

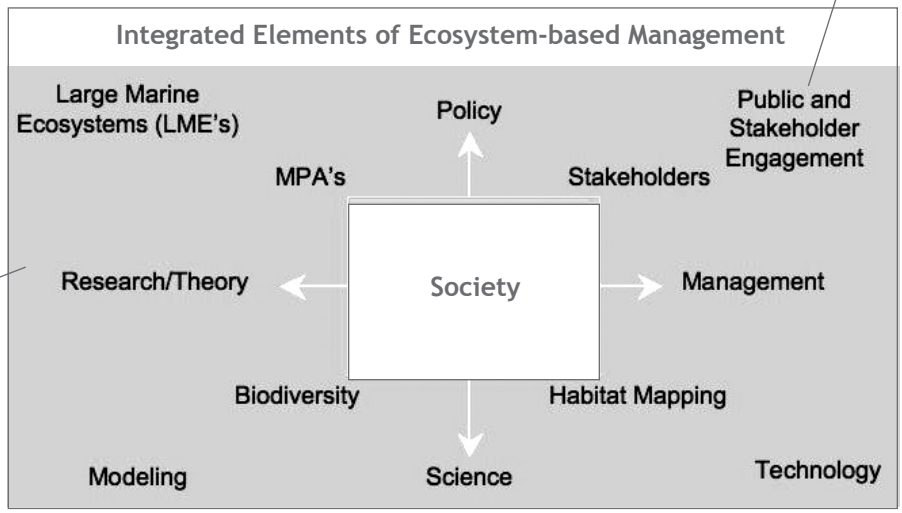
Public and Stakeholder Engagement with Biodiversity Theory for Management



Christopher Cogan

Every slide I'm going to show I could discuss for an hour or more, so there will be a bunch of stuff I skip over. I'm working in a number of these things, in fact probably all of them, but I do realize this is all connected in the middle (Society).

What I want to focus on is this part here, public and stakeholder engagement, and how that is connected to everything else.



I am interested in biodiversity, I am interested in ecosystem-based management and am sort of a geographer biologist. I do a lot of geographic information systems mapping, remote sensing, and digital image processing, but to me, those are all the tools. It's all about how we manage our environments, and one of the goals there is ecosystem-based management. How we tie these things together, like stakeholders and society, is a real trick.

Ecosystem-based Management (EBM)

An integrated approach to management that considers the entire ecosystem, including humans

From: McLeod and Lubchenco 2005

So what are the goals that a lot of people are working towards? EBM is not the ultimate goal, the ultimate goal might be sustainability, but this ecosystem-based management is integrated and ties all of these elements together.

One of the kinds of goals this is getting at is maintaining viable populations of species. It's about representation, often in protected areas. That's what ecosystem-based management is about. It's about ecological processes, not just species, making sure nutrient cycles are working the way they're supposed to be working and things like that. It's about disturbance regimes. Disturbance is natural. There is fire, for example, in chaparral ecosystems. We need to work with all of these things over long time periods, which are not NSF funding cycles. Maintaining the evolutionary potential of species and ecosystems tends to take a long time. Some would say seven generations is the right time. And very important is human use. Human use is part of this whole thing, and this is what most of us scientists like to steer away from because it's hard. I'm going to focus in a little bit more on number five.

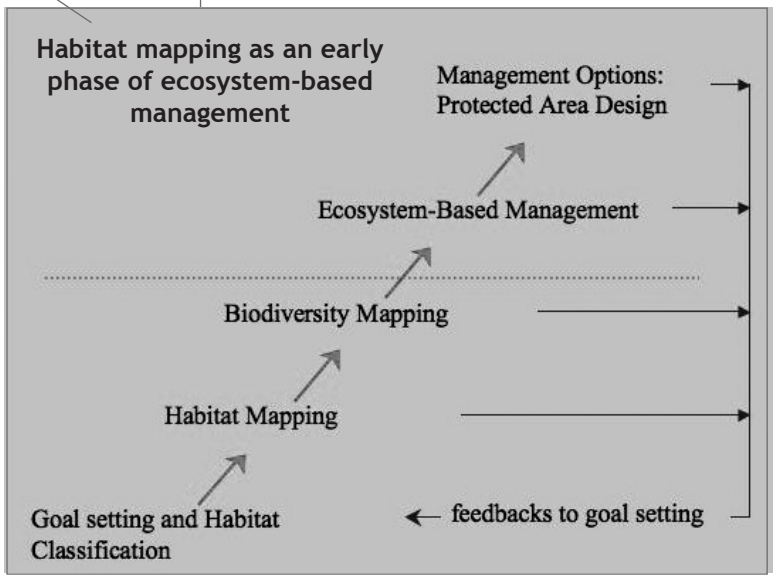
This is a simplified version of some of the things I've been working with in the idea of setting science goals. I work with mapping a lot and have to come up with classification systems. There's not a map around that exists that wasn't based on a classification system. If you don't have a classification system, you can't make a map, it's as simple as that. Even though you might not have thought of it that way, that's how it works. Then we can map habitats, and then we can talk about biodiversity, whatever that is. And if we can think about biodiversity, we can start to get into ecosystem-based management, and if we can do that we've got a lot of options open, like protecting areas as one option. Then there's always

EBM Goals

Five key goals of EBM for sustainable ecological integrity:

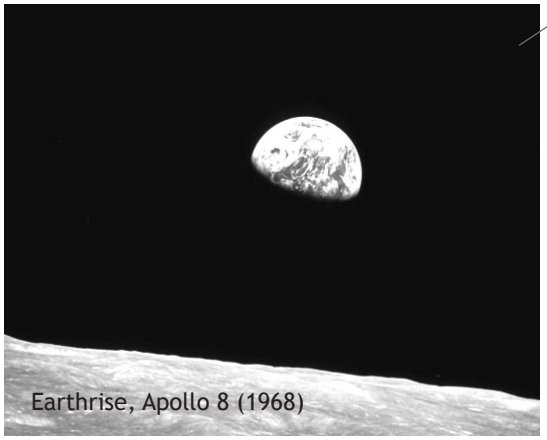
1. Maintain viable populations of all native species in situ.
2. Represent, within protected areas, all native ecosystem types across their natural range of variation.
3. Maintain evolutionary and ecological processes (i.e., disturbance regimes, hydrological processes, nutrient cycles, etc.)
4. Manage over periods of time long enough to maintain the evolutionary potential of species and ecosystems.
5. Accommodate human use and occupancy within these constraints.

(Grumbine 1994)



Ten dominant elements of ecosystem-based management (EBM) that can guide habitat mapping.

1) Hierarchical Context
2) Ecological Boundaries
3) Ecological Integrity
4) Data Collection
5) Monitoring
6) Adaptive Management
7) Interagency Cooperation
8) Organizational Change
9) Humans Embedded in Nature
10) Values for ecosystems

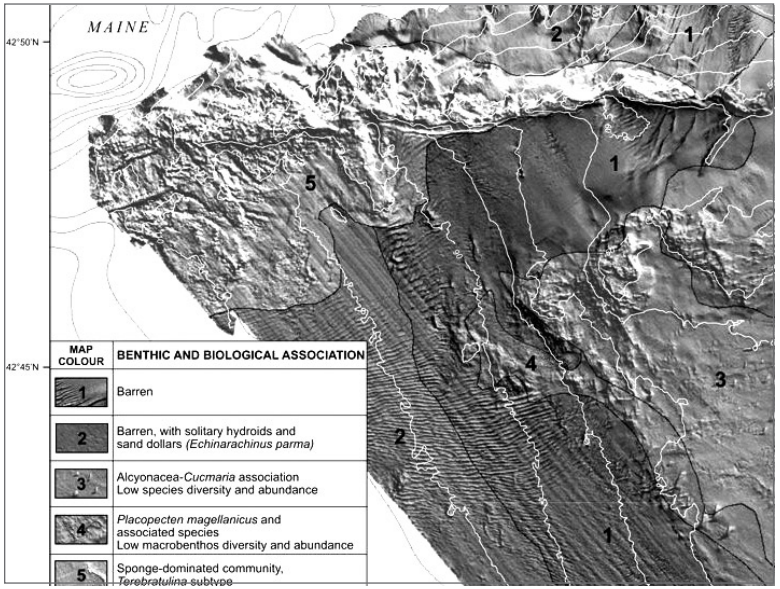

Earthrise, Apollo 8 (1968)

feedback because we never know how to do this right the first time. That's called adaptive management, and on we go again.

It turns out that ecosystem-based management needs ten things, and this is sort of repeated throughout the literature over a very long time. Those ten things are what this is all about and if I had an hour and a half, I'd tell you about all of those. I'm going to focus on number nine, humans embedded in nature, and the idea that people need to have or do have values for ecosystems, and in terms of management and promoting sustainability, we need to understand how that works because if we don't have all ten of these, we can't get to ecosystem-based management. Physical scientists kind of like to stop at number eight, organizational change.

Here's a picture we all know, all the way from 1968. It's just a picture, just a photo, but some say that's one of the turning points for the whole environmental revolution that I would say we are still in. If there are three revolutions in human history, this is number three. But it's a photo, and this photo engages people. My thinking is, it is just a picture, but it shows this earth the way we never saw it before, and in my work I like to use maps as the pictures. If a picture is worth a thousand words, then a map is also worth a thousand words. If we can deliver a series of maps that are valid for all of those ten things, we need those maps. We've got to do that, though those maps are very expensive. Those maps are data. I work with geographic information systems and computer maps, smart maps, but on the other side, number nine and ten on the list, the maps communicate to people in the way this photograph did.

Below is one example of a map, which is showing a sea floor, so this is an area that no one can see, sort of like the earth from space. This is a coastal shelf, a whole marine ecosystem that very few people have seen unless you've been in a submarines or looked at underwater video, and yet it's critical to the economy, to the environment. And it's just one



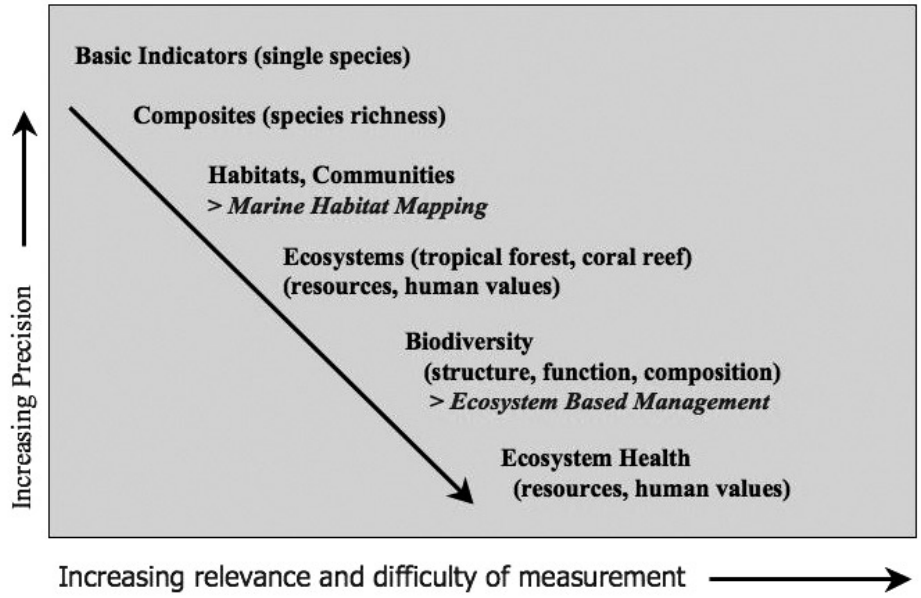
example of a map of a type of habitat that is right here in California and is vitally important to the state and to the nation. So if we can develop this kind of series of habitat maps, we can start filling out those ten elements of ecosystem-based management.

It gets a little bit complicated now and I can't go through all of this in the time available. We have a lot of trade-offs. We've got precision versus things like relevance, and oddly enough they're in opposition. We have things like we've got to study single species and know those well before we can get to the really relevant stuff like fuzzy ecosystem health, which is very hard to define, or just thinking about biodiversity and ecosystem-based management.

So all of this is folding in and these are trends in science today. We used to be more up at the top of the diagram below and now we're including ecosystem health. But that single species stuff is still important because without that we can't get to ecosystem health.

Christopher Cogan

Trade-offs, prerequisites, and trends in biodiversity and ecosystems research



Adapted from Costanza (1992) and Redford (2003).

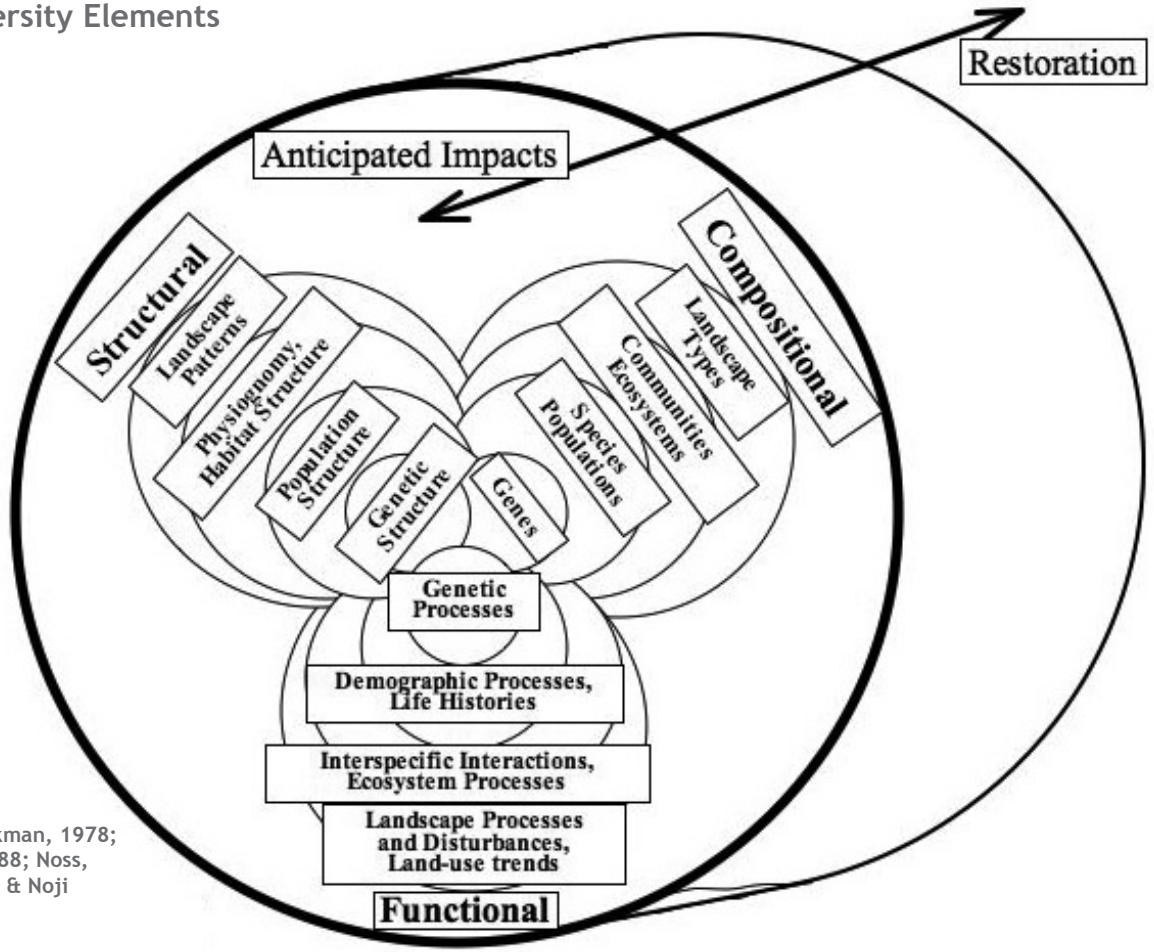
The Problem with "Hotspots"

I actually cringe a little bit with the term "hotspots" because the term "hotspots" in the Myers paper in 1988 was really focused on species richness or alpha diversity. But biodiversity, as recognized in the serious scientific literature, not the popular press, is all of this, and we run the risk when we are talking about hotspots of talking about just species populations. I like hotspots, don't get me wrong, it's very cool and that's a great vehicle, but as other people have talked about, we need to worry about the coldspots. I'm a little uncomfortable with the hotspots thing, but it sounds nice so let's use it.

Speaking of biodiversity, this is one of my passions [below]. There's a problem with biodiversity. It's a nice buzzword and people like to use it. Unfortunately, it's often misunderstood.

Here is biodiversity, its structure, its composition, its functions, these multiple themes, its multiple scales from genetics to landscapes. And it's temporal, it's not static, so we can think about that as a slice of biodiversity, we can think about past states as restoration, and we can think about future or anticipated impacts, all within this biodiversity model. And to be totally honest, there is no way we can have all of that information, it's too much, but at least we know what we're missing and so then it's useful. But let's not

Biodiversity Elements



Source: Barkman, 1978; Franklin, 1988; Noss, 1990; Cogan & Noji 2007

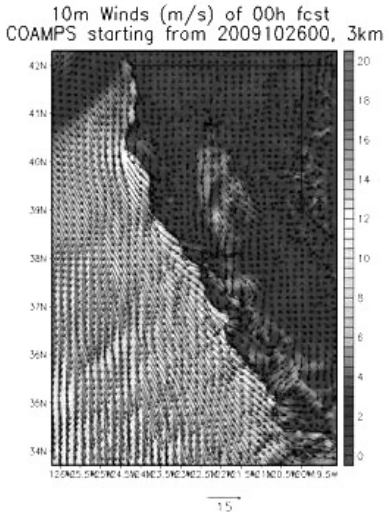
lose track that we're not just talking about species populations.

I talked about habitat maps and using biodiversity and ecosystem-based management. I wanted to toss out that habitat maps can be all kinds of things. This is one [below right] that I worked on a week ago. This is a piece of a habitat map looking at the California Coast, and this little rainbow of colors is the output of the model looking at coastal properties [Ed. note: map was originally in color, with rainbow color along the coast]. That's a habitat map in a way. It's very small and it doesn't tell us a lot. Unfortunately for me it's 5,000 lines of C++ code. It doesn't look like much, but it took a lot to get there.

So habitat maps can take many, many forms, and all of those together can lead us to support ecosystem-based management and sustainability.

One last thing I want to mention is that a lot of this is based on maps. As I've been teaching this semester to students who want to be teachers in elementary school, I've especially been made aware of the idea that we're not spatially literate unless we've been trained to be. That's a problem because here I have all of these maps, but unfortunately most people can't read maps. And it turns out it's not just kids, it's adults. Unless we've had some sort of education, formal or otherwise, it's a foreign concept. It's this flat piece of paper representing the world.

So part of my new passion is that we have to change the way geography is taught in elementary schools. Then we can get to ecosystem-based management, and then we can get to sustainability. It's a tough road. Memorizing the states and memorizing which rivers feed the Mississippi River isn't going to do it, so spatial literacy would be a key topic.



Wind Data: COAMPS. Coupled Ocean / Atmosphere Mesoscale Prediction System
Naval Research Laboratory, Monterey Marine Meteorology Division

Issues, Thoughts, Paradoxes

Overlapping, Resonating Themes

• What I find interesting is the overlapping synergy among the things that you talked about. When we pulled you together for this advisory group, we hadn't even met all of you, but your backgrounds and the work that you do seemed to resonate with what we are trying to do on this project. You may not have met each other before, but there is in your work a really interesting overlap and a relationship to the museum and what the museum is trying to do. I think when we go back and look at the documentation of this meeting we will see these emergent properties from the session today.

• Kathleen McLean

Matt Matcuk

PARADOX: SCIENTISTS AND THE UNSCIENTIFICALLY INCLINED

• I'm interested in what people think about the following paradox. What we've got in this room, for the most part, are all of the kids who sat at the front of the classroom in science. Ninety percent of the kids don't. I wasn't one of them either. Regardless of where they started off, we've got a lot of people in the room who are at least very knowledgeable about their area of science and very passionate about nature. The vast majority of my visitorship is neither. They are neither passionate about nature, nor are they at all knowledgeable about any of the natural sciences.

The paradox to me is that on the one hand, we could go on the basis of ethos-based argument, right?. What people need to see is the passion of the scientists in order to be motivated, and our curators will frequently talk about that. They'll say, "Visitors come in the door to hear us curators," and I'll think, oh boy, they don't actually. They're here in my museum for a completely different reason, but that's the ninety percent of them. Those are the ones I want to reach. It's important to bring along the next generation of scientists, not just important but crucial, but the vast majority of our visitors will never be scientists either.

So how do we deal with this paradox? I told someone at the break that my wife said, "No one should be a teacher in a subject that came easily to them." Those are the people who are going to have the hardest time wrapping their head around why others don't get it. We've all had teachers like that, right? So what do we do about that?

• Matt Matcuk

• I have a thought about the paradox of passion (ours) versus what I first wrote down as "disinterest." Then I realized it's not disinterest, it's more like noninterest because of lack of awareness or experience. It brought to mind a book that's out called *Sorting Things Out: Classification and Its Consequences* (Geoffrey C. Bowker, Susan Leigh Star, MIT Press, 2000). It basically talks about the idea that if you're in a system (organization), there are things you can't see it. It takes someone from outside the system to point out what you don't see because you sort of collude in the process. So then I thought, here we all are again colluding in the process. It is like there is a tacit agreement that individuals who are not passionate about nature can't be interested in it.

• Julie Johnson

CONNECTING WITH THE NATURAL WORLD

Portals, Time machines to the Natural World

- I think all of us are suffering from this separation from the natural world. I think all of us surround ourselves with a very seductive cultural barrier, an architecture, a political barrier, and just day-to-day family structure, caught in raising your kids or whatever. Oftentimes we do feel separated because of the world we live in and because of how we relate to it. We feel apart from it.

  I think our goal as natural history museums is to provide a portal. Most of us may never encounter a lot of the wild areas and the creatures that we display, but in these time machines and portals in natural history museums we can make that connection. We can hook people to the natural world by using, though this sounds strange, an illusion of it within the museum. I think that's what those exhibits are over in your gallery. I know I myself am often caught up with my day-to-day activities and don't really feel connected, but I think that's what our goal is. • **Stephen Quinn**

A Spiritual Connection to Nature

- I think one of your main goals is to somehow reconnect with a lot of the aboriginal beliefs that we are a part of the natural world, that we really are players in this ecosystem, that cities and towns are no different from beehives or anthills and recreate an almost religious (I hate to use that word, but I feel strongly about this) relationship to nature and all of the other living things that we share the planet with and we have an accountability for and a responsibility for.
  • **Stephen Quinn**

Making Green Part of Your Life Story: Connecting with Honeybees in Chicago

- I would like to reframe the way we think about the separation thing. I find that it keeps me from actually moving forward, so I'm not disagreeing, I'm just trying to think of something different. Things like our economic life, our political life, our social life are very real. We breathe in those times too, we eat during those times too. I think it's about building relationships or strengthening those relationships or clarifying those relationships with the natural world within that context.

  You brought up beehives. A few months ago I had the privilege of being in Chicago, and there's an organization there called the Northlawn Employment Network. They were looking for ways to work with underserved communities, particularly previously incarcerated men and women, mostly African American, convicted of low-level crimes and in need of finding a job. They brought in a woman, Brenda Palms Barber, from Denver and she was trying to come up with an idea.

Connecting with the Intrinsic Drama in Nature

- I loved the comment that there was no Kumeyaay word for "wild." I think that's wonderful because I think you should go out in your backyard, lift up a rock and see a world in there. We look at computer games, we look at television, we look at the movies, and we thrive on that drama. Well, we have to make the point that right in your backyard garden there is amazing drama, there is a incredible world within the pond near your property.
  • **Stephen Quinn**

From left: Scott Sampson, Stephen Quinn

Connecting with People Where They Are

• People have to stand where they are, so if we're asking community people to be engaged in creating a passion around the dioramas, we have to recognize where they are, not ask them to come where we are. Where they are is valuable and that's the relationship they live in. • Carolyn Finney

Carolyn Finney

She came up with the idea that she was going to have them make honey. Everybody looked at her like she was crazy. This was Chicago.

What they did was bring in beekeepers. They have twenty-five apiaries. There's a crack house across the street from the house where they make the urban honey, and there are working girls on the corner as well. They have the beekeepers train the previously incarcerated men and women to make the honey. Not only do they make honey, they make body products. They sell to all ten Whole Foods in the Chicago area and you can buy the stuff online. I have some of their lotion and it's fabulous.

What was most moving for me was when they had one of these young men get up in front of a group and talk about his experience working with the bees. They're a green business because they don't feed their honeybees sugar derivatives. They had to learn all about the life of the honeybee, and everybody in this room knows how important the honeybee is. When this guy got up in front of the room he said, "I never knew how good green could be to me." It changed his life entirely. For me, that is a very real relationship. He exists within that world, he's been in jail, he's had to find a way to make a living.

The woman who runs this organization talked about transitioning skills. She interviewed some of these people and asked, "Why are you in jail?" They'd say they sold drugs and she'd ask, "Were you good at it?" When they said yes, she'd ask why and they'd say they knew their customer base, the quality of their product, all of these things that just need to be transitioned.

Now they have a real active relationship with the natural world in a way that they hadn't imagined before, and not only do they see the natural world differently, but they see themselves differently and the relationship suddenly changes. I would hope that we would take this opportunity to rethink what those relationships look like. I don't quite know how to say it. • Carolyn Finney

• To become a part of everyone's life story. • Stephen Quinn

• Right, because it is. • Carolyn Finney

META-ISSUES

• I'm going to do the opposite. I'm going to go meta because that's how I think, and I apologize in advance. I always try to make it three points because that's what people can remember. • Doris Ash

A Precious, Locked-in World View of Dioramas

• One is this preciousness of the material in dioramas, the wonder and all of this. I think we really have to be careful in how we view this preciousness and this locked-in perspective.

This is something Matt touched on. People don't share our world views. We're the privileged, we made it through the system. Most of us are Ph.D.s for pete's sake and we work at good places.

So it's the preciousness of our world view and other people having to share our world view and the locked-in-ness of that. And dioramas are the vehicle for that because whose story is it? It's our story. It's not anybody else's story, it's based on the research that people bring to the study with them. It's that preciousness, rather than coming to the community point of view first. Rather than saying, "How can this diorama refer to these people?" flip it around. How can the resources that people bring have something to do with our diorama? It's not that we have to filter it down in some way for people, I think it has to filter up. That's a world view shift, and I'd like to think of us changing our world view

• Doris Ash

Engaging Youth and Their Stories Without Reinventing the Wheel

- The other piece is engaging youth in a new way. There are people out there doing it better than we are, a lot of them, and we are old fashioned. There's all kinds of technological stuff out there, it's beautiful. And I want to piggyback on the idea of everybody telling a story. Youth can tell their own stories. They don't need much from us on this one, by the way, they need a little guidance and mentoring. • Doris Ash

Loaded Words & the Power of Language

- The other metapiece that really resonated with me was Richard's story of the power of language. That couldn't have been a more powerful thing for us to learn because we're throwing it around, it's embedded: "management." What would a Native American say about the phrase "management of ecosystems"? Is there such a term? The words we're using are so loaded, they're just incredibly loaded. And "separation," what does that mean? That assumes that we take a mind-set that there is one. Is there one? I'm picking the words that we use as hotspots. Even the word "hotspots" is loaded. Are there coldspots, are there mediumspots, are there nospots? All of these words we're using are so loaded with our own cultural, social, historical overtones. I would worry about that. Even the word "diorama." • Doris Ash

THE IMPORTANCE OF THE WILD

- I have different views on the notion of wildness. Richard was saying that in some indigenous cultures there is no term for that. That might be true, but I suspect that there are terms for many of the qualities of wildness, such as "fear" and "respect" and "awe" and "vastness of space." I think we're losing those qualities, and as we lose those qualities, I think we're impoverishing who we

The Difference Between "Ecosystem Management" and Ecosystem-based Management"

- I'd like to be clear that I wasn't talking about ecosystem management. That would be god-like. I was talking about ecosystem-based management, which is very, very different. It means trying to learn everything you can and then manage the best you can. It's a big, big difference. • Christopher Cogan

Doris Ash

Local Experiences with the Wild

• Last weekend I was at Fort Baker, right near the Discovery Museum, and we were there right at the turn of the tide and saw the Harbor Porpoises feeding. This was wild nature, right? And it's local. It's Marin, so it's not quite Oakland, but it's an easy bus ride from right here. • Dan Rademacher

Kathleen McLean and Julie Johnson

are as individuals and as a species. Those are experiential qualities and many of us have them, and we come out of them and start creating things, but we create artifacts based on these deep experiences that people are now trying to recreate in a museum setting. Many of these kids haven't had these experiences, so we have to recognize that these experiences are what we've lost.

What I'm trying to put on the table is that some of these experiences aren't local, everyday experiences. I had a Children and Nature Network meeting in Minnesota. It was a three day event, and I agree with everything they're doing in terms of the importance of everyday nature, but the point I also tried to make is that we come out of a long evolutionary history where there was a wild aspect of it. Whether we use that word or not doesn't matter to me, it's the type of experiences involved. Just being under the night sky—it's powerful, it's deep, there's a sense of awe and vastness. Anyone who's had it feels aspects of that, that's why it's so beautiful. And now we have light pollution and air pollution and huge cities, and some kids have never seen the night sky. Can you imagine?

We can create a diorama about the night sky, but we've lost something so critical and so beautiful in human existence. There are many, many of these types of interactions. I think if we're going to work in the museum context, we need to get a connection between what we're doing out here to not only local nature but wild nature and have the wildness as not something that gets dismissed but as part of the dialogue. I'm not saying it's the whole dialogue, but we need to have it as part of the dialogue to be able to get the connection between the built environment, the artifactual and technological environment, with the domestic side of actual experience with nature—and I'm suggesting also the wild side. • Peter Kahn

THE INSIDE-OUTSIDE MUSEUM-NATURE CONNECTION

Starting Outside; Putting Dioramas Where People Are (Physically and Mentally)

• I tried to think about the set of experiences that you create. I think what I heard earlier and read was about trying to make an exhibition so compelling (though not so compelling that it never goes out of date) that people will want to go outside or will reconnect and see in different ways what's already there. I'm actually now wondering, how about if your experience starts outside as opposed to starting inside? I don't even know what that looks like, but it's almost like the outside should be superordinate to this. You might want to think about alternatives.

Maybe your dioramas aren't all here, maybe they're out in different places. Those draw people to the museum for a particular reason and then they go back out. Some way to sort

of shift the experience for where people are, for where they're living, so they can see something differently because they're in it. So maybe the dioramas are outside the museum. That would cause people to go, "Oh, I hadn't looked at it that way." There's some reason now to come here to look at it in a particular, different way. This is just a thought, I don't have it fully fleshed out, but it's about that relevance piece and connection because I can only have passion about something I have a little bit of experience with. If I don't have any experience with it, I can't have a passion for it. • **Julie Johnson**

Dioramas as Stepping Stones to Direct Experience with Nature

- You can't have passion for something you don't have experience with. I think one of our goals as a group is that we would like people to be more passionate about the natural world. If you don't have experience in the natural world, you're not going to be passionate about it. Most people who are environmentalists who work in conservation have direct experience as children outdoors, unmediated time where they just hung out and did something like rafting or whatever it is that they did. How are we going to get urban kids to care about nature? Well, you're going to do that by giving them experiences in nature.

  So what are dioramas? How do they fit into this? We need to get away from this paradigm that museums are an end unto themselves. You go to a museum and you see an object, whether it's a painting on a wall or a diorama or a dinosaur skeleton. You think, gee, that's really neat, and maybe you even feel a sense of wonder, and then you walk away. I think that's a Victorian concept and we need to move away from that. Museums need to become places that are basically stepping stones to other places.

  What I would suggest is that maybe the dioramas become your stepping stone to get people out into the California hotspot. Maybe it's a way of educating them about the hotspot and then they go out and experience it. If you're going to invest a ton of money, invest it in getting urban kids out to have these experiences, and you can have experiences in an urban setting. As we know, there are gardens and apiaries and all kinds of things. If we're really going to bring up a generation that's passionate about the wild and care about the place where they live, they're not going to feel that by going to a museum, they're going to feel that by being outdoors. So maybe the museum can be the conduit for this community to get out into the larger aspects of nature and care about it and protect it. • **Scott Sampson**

Including a Focus on Urban Environment

- I thought Julie's point was really well made, that we always present nature in natural history museums as somewhere else, and you always have to travel to some exotic

Giving People Tools to Start Where they Are (e.g., Urban Hotspots) and Use at the Museum and Elsewhere

- I just had this thought about urban settings as California hotspots. People live in a variety of settings that are natural to them and are the ecosystem in which they live. It's not a California hotspot because this other group says these are the things that are hotspots. In terms of thinking about people's experiences where they are, I'm wondering whether or not there is some way to consider the urban as hotspot experience, where you gather tools to think about how you look at your hotspot. Then you use those tools to come here and look at different hotspots, and you can also use them to go elsewhere and look at different hotspots. I'm just trying to think about this notion of where people are and how to build on the experiences that they're having and/or change their frame of reference around the experience that they're in to enable them to look at other settings in a particular way.
  • **Julie Johnson**

The Importance of Family Experience

- I think yes, we have to engage urban kids, and to do that well I think we have to engage their families so they become family events. Most kids go home and have a family there, and part of that continual learning experience is going to be supported by what their parent or parents or guardian are experiencing as well.

• Carolyn Finney

Curriculum Modules and Creative Teachers

- I'm still mulling over how we reach the students who didn't sit in front of the class. There was a comment about bringing the parents in, but then I started thinking about the parents of those kids and thinking that might not be the best solution just yet. It seems to me there needs to be a clear linkage in the way of learning modules in the classroom and these activities here that create a continuity between what's being presented and then what can be taken by a responsible teacher who can reach these kids in a way that hasn't been done before. That's where the new ideas are that will bridge across museum diorama and outside personal experiences and then the classroom setting that has long term sets of goals that can allow somebody to reach new experiences. • Norman Miller

location. I think we really should focus on the urban environment. There are programs like Cornell University's Backyard Feeder Watch, like the National Wildlife Federation's Backyard Wildlife program. You could have a flower box on your apartment window and have a Monarch butterfly come to the flowers that you plant to attract butterflies and feel that connection with the natural world. I think that would be well worth pursuing, to include urban environments. • Stephen Quinn

INTO THE WILD

Facilitating Deep Experience with Nature

- Whether it's through use of dioramas or not, I really like the idea that the role of the museum would be to facilitate those experiences which would probably have to be outside. Often in the literature it's discussed as the "wilderness experience." This is right out of deep ecology and goes back to at least Leopold, describing shooting a wolf and watching the green fire die in the wolf's eyes, and transforming Leopold from a forester to an ecologist. Even if you don't buy deep ecology, there's some interesting stuff there that gets at what we're talking about. It would be good if the museum can facilitate that deep experience. We've heard a bunch of people talking about their individual deep experiences already, and that's that formative instant in time when we connect with the environment. That is what we have heard from a number of people here and it is described in the literature pretty strongly.

• Christopher Cogan

Fear of and Unfamiliarity with Nature

- In talking about deep wilderness experience and Leopold, I have two very different feelings that come up at the same time. The first is, yeah, I've had some of those deep experiences in that Western, defined way. For some people, because of their cultural backgrounds, the idea of being out alone in the wilderness and seeing the night sky isn't exactly a good time, and there are people who will say that.

  There is a writer, Evelyn C. White, who wrote about Black women and the wilderness (essay, "Black Women and the Wilderness," 1955). She was invited a few years ago to Oregon to teach a writing workshop and she was the only African American, and the teachers and students kept trying to get her to go kayaking and do all of these different things. Ultimately she had to admit that she was scared because she thought about Emmet Till and the idea that there's no Black people out here, and what does it mean for me to be in the woods.

  She has since confronted that because she had a conversation with people who heard that. Then she could develop because she wanted to have that deep experience as she heard other people say it. And this is along with a college degree, and I've heard

this story more than once from people you wouldn't expect it from. So one way we help to facilitate that experience is recognizing that for everybody that's not a goal and for some it's scary to do it. • **Carolyn Finney**

Back to the Wild: Moving People into that Deeper Experience

- I think it's absolutely right to try to start from where somebody is. One of my earlier studies was in inner-city Houston. We interviewed inner-city African American youth, both kids and their families. I remember one of the conversations with one of the moms. She was saying, "I was walking down Alabama Street and all of a sudden I realized they've cut down all the trees. I loved those trees, they're gorgeous. I didn't know that my son also recognized this until he said, 'Momma, why did they cut down all the trees? That's how we breathe.'"

  This is the inner-city, and it was an earlier study, and I think it was part of the study where was more prevalent cultural stereotypes about the inner city that people of color especially are not interested in environmental issues. I think that was a stereotype and one that is less held today. So yes, one needs to start from where people are, but yes, there are environmental commitments and depths of commitment that all of us share. But I want to connect that to my first statement, which is, just because that's where we are doesn't mean that's where we have to end up. There's increasing movement where if somebody is scared of the night sky, you don't just throw them out under the night sky and have them freak out, and yet if you can move them into that space there's a beauty and depth and awe of experience. I put some value judgments on that. I think it's a deeper experience to have it than to not have it, and if we move into a world that we create with our artifacts and our urban environments where we don't have that experience, we'll be impoverished as a species. That's why I also want to hold out this other quality. • **Peter Kahn**

USING TECHNOLOGY

Technology as a Creative Force and A Tool for Visitors to Contribute Their Nature Experiences to the Exhibits

- I'd like to think about technology as we're coming to a point where I think it can be a creative force and not just a mediating force. We're trying to create a partnership with this group that works with teens to create media about the environment around them, about their school or about a park near them. There are all of these tools that are pretty easily available.

  If I had been more prepared for that porpoise watching experience I described at Fort Baker, I could have taken the bus there, created media about that story and posted something. Then you could layer that on top of real scientific maps with information about tides and stuff like that. So my story of that

Dan Rademacher and Matt Matcuk

OMCA Natural Sciences Gallery: Issues to Consider

- These comments in the passion statements and this morning's discussion are all exactly along the lines we've been thinking about as we've been putting this proposal together and now moving into the design phase. This afternoon we're going to have a discussion about some of the challenges that we have been thinking about that you may want to consider as you go on a self-guided tour of the gallery.

Places

One of the things we've been thinking about is the places we select. We're not doing all of California. We couldn't possibly do all of California. I'm interested in this idea of introducing people to the concept that nature is in your backyard, but then there are the wild places, and to what extent do we balance those in our selection of places? Maybe it's even people talking about their fear of being in these wild places.

Sense of Connection to Place

The other thing we're going to talk a lot about is how we give people the sense of connection to place. We've talked about introducing visitors and partners and other conservation organizations and scientists, bringing in their experiences in nature as part of the exhibits. You have mentioned stories and the resonance of stories, and we have the ability to do that in a museum that has art and history as well as science. Over and over, that's what we hear from our visitors. It's the behind -the-scenes stories, it's the personal stories that people tell that really resonate, so we're thinking about how to make those connections.

Visualization

Another thing we will be talking about in one of the groups is visualization, so what does that mean? Is it mapping, is it data, or is it the live feed kind of thing that Steve is talking about?

All of this conversation will feed into the discussions we have this afternoon about how to bring this to life in the gallery. • **Lori Fogarty**

porpoise watching within an easy bus ride of San Francisco becomes a layer on top of or next to or with this habitat map or tide flow or whatever it is that causes the porpoises to show up there. You could do the same thing birding at Middle Harbor Shoreline Park, right in the middle of the Port of Oakland. So you have these tools. The technology used in the museum with the diorama isn't to provide more information or even emotional advertising, but it's a platform for your visitors. The message is that if you get inspired by this and if you create something, some digital photos or a little slide show, you have the opportunity to show that here. You can become part of this exhibit when you come back.

I think that is really powerful. We're working with these teenagers to try to give them a place on our Web site, and their teachers are really excited about the students' opportunity to be on *Bay Area Nature*'s Web site. From our point of view, we're so desperate trying to reach that audience that we're excited that they're excited. • **Dan Rademacher**

Live Feeds to Source Sites of the Dioramas to View Changes Over Time

- Something that we're exploring in New York is that many of our dioramas (and we have over 250 of them) depict sites that are actual locations. A team of artists and scientists went to a site and documented a very specific locale. Most of them were done in the twenties, thirties and forties, so they really are a time capsule. We're exploring the installation of live feeds from those sites so that you can touch the screen and have an image of what that ecosystem looks like today. In some cases we know that wetlands have been drained and they're now agricultural. In many cases it's a great success story. A lot of these sites have become national parks and preserves, but many of them have become degraded and changed.

I think if you develop these four hotspots as you say and have them depict topographical features that are going to show up in this live feed, you will maybe connect with this epiphany of a personal encounter with the diorama and then provide this additional level of information where you can actually see it in a live feed. • **Stephen Quinn**

Project Evaluation

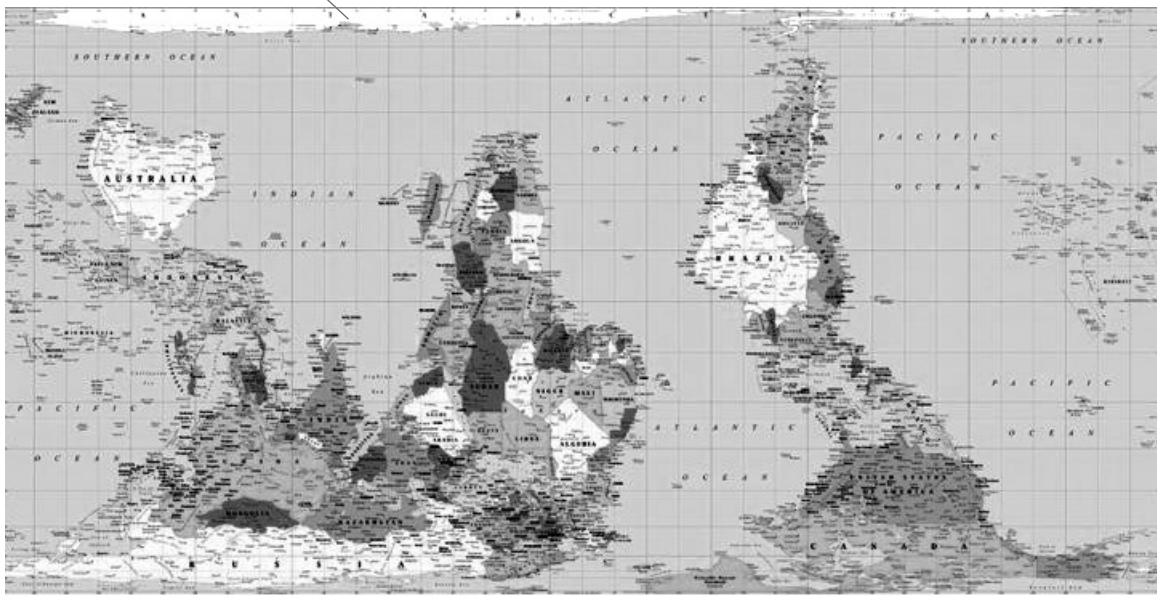
CECILIA GARIBAY

Principle, Garibay Group

My task is to address and introduce to you what we're going to be doing in terms of research and evaluation. I first want to back up and give you a bigger picture of what I think the role of research and evaluation is or the way we've been discussing the role in this particular project because I think that's important.

I'm sure many of you are familiar with the map below. It's an image close to my heart because I think this is what I strive for in most of the research and evaluation that I do. It is to tilt things and have people look at it from a different perspective. A lot of my work and my passion is around looking at engaging diverse communities in informal learning. "Informal" is often used in connection with science learning, but it really is across the board and across the spectrum of different kinds of learning environments. A lot of the work that Garibay Group does is around research and evaluation projects that look at engaging a broad range of communities. A lot of the work I do happens to be with Latino audiences, but it is really about working with broad cultural communities as much as possible, and work as much as possible with girls. So it is really about looking at diversity writ large.

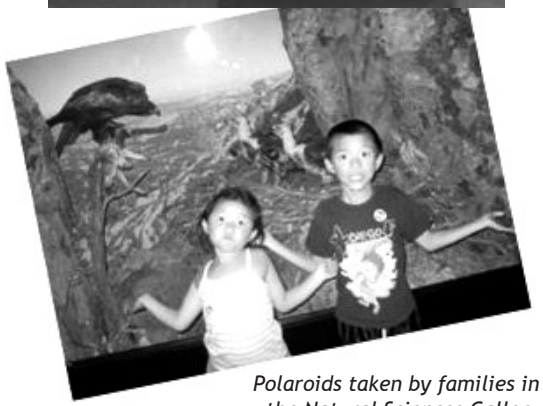
I think the evaluation and research in this project, certainly the way that it is framed in



The Importance of Family Experience

- Cecilia Garibay is based in Chicago and is the researcher/evaluator on our team. Cecilia was one of five museum professionals from across the country to be selected for the National Research Council Committee on Learning Science in Informal Environments. This is a very big deal because finally the National Academies decided that informal science was worth studying. • **Kathleen McLean**

Cecilia Garibay



Polaroids taken by families in the Natural Sciences Gallery

some of the documents that you have seen, particularly the NSF proposal, is really about using research and evaluation as a way to engage communities and have that particular filter be part of what is happening. So a lot of what I'm going to talk about today is not going to be as much about the specifics that will be used, but really more of the broader level regarding the goal of this research and evaluation.

Related to that, I wanted to review some work that was done prior to the NSF proposal. It's really in tandem to it. We were interested in figuring out what was happening in the galleries right now. One of the things that we did was invite families from a broad range of communities within the Bay Area to come visit the gallery. We took a leaf from front-end research, looking at what people's experiences were in the gallery. The types of questions we explored were: What kinds of interactions are happening? What are families doing? We were very interested in finding out what ways they related to the dioramas. What kinds of stories came up? What kinds of memories? What exactly was happening? We also explored some questions related to their connections to nature and so forth.

One of my favorite pieces of the study is that we gave families cameras to take through the galleries with them. They were actually Polaroid cameras, and the reason for that is that there is something very specific about having the physical photo. The practical reason is that we then used the photos for the post-interviews to talk with them about what their experience was like. We had some parameters. For example: What did you not like? What did you want to know more about? What did you really like? What was something you found interesting? That was something that was in common across all of the families who went through the gallery for this project for the front-end.

It was fun just for the research geek in me, who is continually wanting to find out what is happening, what are the experiences like and what can we unpack. But I think one of the most intriguing pieces of the research that was unexpected is the degree to which how many of the photos were of people.

There were a number of photos taken in response to, "What did you want to know more about?" that tended to be a case or a particular specimen, and there wasn't any one thing that stood out. It was something that grabbed their curiosity or something that visitors were frustrated about in terms of not having enough information to unpack. For example, "There's not a label here, so I can't identify it, and therefore I can't really move cognitively beyond that point because I don't know what to call it."

Another example of what people were frustrated about was, "I see it, I know what it is, but I don't know what is going on here." It really went back to that cognitive narrative:

What's happening here? What's the story? Talk me through it.

So there were all sorts of interesting insights, but this one I wanted to point out in particular in light of this morning's conversation about the importance of the social group and what is happening in terms of the dynamic, and how much of it was inserting themselves as part of the experience they were having at the gallery and at the diorama. It was interesting when we were doing some analysis by doing photo sorts, taking a look at how they were clustering. In the photos of every family that went through the gallery you saw people, and I can't think of an exception. I saw that as the highlight from the front-end because I think it reinforces much of what was said this morning about people's stories and families. Not only the goal of wanting to connect people to what's happening in the gallery and having an experience in the gallery, and the broader issues of nature and environmental conservation and stewardship, but I think it tells us that families are naturally wanting that connection and doing it. So I think there's a lot of unpacking there that we could talk about. That is just a very quick frame of some of the research that was done prior to the NSF proposal. We are now at the next stage.

I want to show you a photo that has become a real metaphor for me. I used it a couple of years ago when I was doing a presentation on the concept of culturally responsive evaluation, which is the way that I frame a lot of the evaluation and research that I do. One of the reasons that this photograph has stuck with me is because I think it does two things. It's this notion of looking out. I think the evaluation and research that we're doing is very much grounded in community and what we are hoping to learn from communities via the research and evaluation to bring back to develop experiences that are meaningful.

I also have recently been using this photo when I talk about the concept of looking out to look in. It's this notion that one of the unspoken pieces when you engage community, whether it be in the kind of broad development that we're doing here, or just in research and evaluation, is that it sort of begs the question of looking internally and understanding what our assumptions are. What are the lenses that we use? What are the frames that we use?

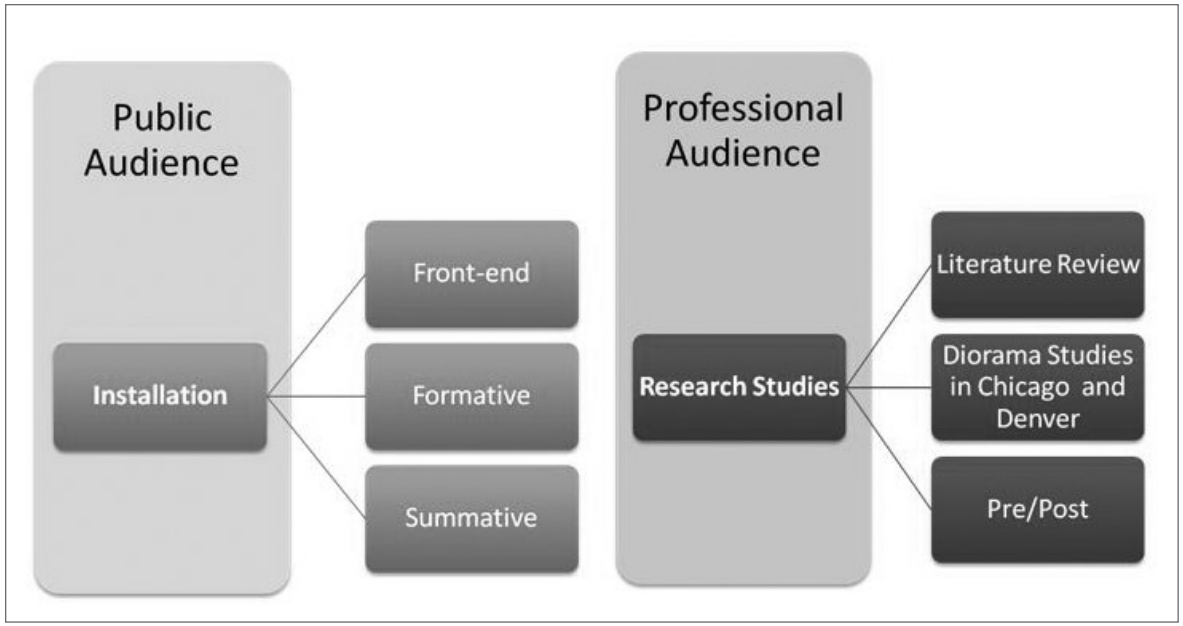
My guess is that much of the evaluation and research that we're going to be bringing to the table, and some of the specifics of the actual work, will be about dialogue with the team, and I think that includes advisory group members as well, about what it is that we're finding out and how that is challenging many of the assumptions that we have. Again, it is interesting to reflect upon how much of this was touched upon in the conversation this morning.

I'm now going to move on to a more boring slide that lays out for you where we are in the research and evaluation piece, and it really does have a research and evaluation

component. For this particular project there are two audiences specifically named in the proposal. The first is this public audience, which is something we talked a lot about this morning, which includes visitors and the community. The idea there is that there will be the instillation in the gallery which has three phases of evaluation built into it. There is the front-end, which I've already talked about.

There is what we typically call a formative stage, which in a very traditional format would involve prototyping early versions of a particular component. It could be some sort of interactive, it could be the way we displayed and interpreted a particular case. It involves figuring out what people are getting out of it by having them try it out. We look for things like usability, can they figure out directions, what are they getting out of it, and so forth.

There's a whole other phase of formative that is going to be happening with this particular project, which is really about finding deeper ways of bringing in community to vet many of the experiences. An early part of that is actually happening internally with the team and involves existing community advisory groups. There are existing advisory committees that represent communities that the museum has very strong relationships with. Some early ideas and interventions will be vetted through that group first, very much in an advisory role, but also looking to how this speaks to community interests and issues and what works and doesn't work. That will be an early phase. Then there will be another phase that is much more traditional: Can we get these working at an individual level?



Then there will be a third phase, which has actually become one of my favorite ways of prototyping. We've done this at the Oregon Museum of Science now for a number of projects. When the team gets to a certain point in the development process, we'll actually mock it all up so it's a 3-D, full version of the exhibit. We'll bring in community members, mostly families, over a course of two to three days. It's very intense. We actually prototype writ large, with families going in and observed during the experience. It's recorded, and we can look at those videos and unpack what is really happening. We will do interviews with families using a Falk

observer type of approach. That is actually very revealing, but it will be again another way to not only meet the goals of what we typically think of formative evaluation in the development process, but to move more into putting processes in place that allow us to come in and check in continually regarding whether this is really speaking to communities and engaging them in the way that we are expecting in terms of meeting the specific goals of the whole installation.

Then, of course, there's a summative piece: Did it work? There are two components. Beverly Serrell will lead a large segment of this impact evaluation, and then Garibay Group, along with OMCA staff, will be looking at post-visit impact. In other words, we'll actually try to follow up with visitors after they've left the gallery to see to what degree it might have stirred them to go out into nature or to what degree they've begun to post and share information of their own on the museum Web site or to the Natural Sciences Gallery. So there is that sort of public research and evaluation.

There is another whole component in the project related to what we term the professional audience. For lack of a better term, we often talk about this as the museum field or museum professionals. That is really about the concept of informing practice. In the next portion of this session we will be discussing diorama dilemmas, and the professional audience piece speaks to that. There are many museums across the country that have dioramas, and yet what we know about the affordances of dioramas and what they offer is not that well known in the field. There are a number of things we think we know. For example, that they might stir the imagination, or that they're really good at eliciting memories. There are questions about the extent to which they help people learn or gain insights about a particular place in nature. How much do they actually help people build connections to nature? There are a number of aspects that are not yet well understood.

Part of the project is to figure out that piece. That is more in the research realm than the evaluation realm, and there are three components to that. Currently, the OMCA team is doing a literature review that will synthesize the information we do know. Some of it is from the published literature and some will come from what we call the "gray literature," a lot of the evaluations that are done in museums.

The goal is to determine what is known, what studies have been done, and what can we say are the affordances of dioramas with a fair amount of confidence. What are the points where we think we might be getting a little bit of a signal that something might be true, that dioramas might be doing a particular thing well, but we're not actually a hundred percent sure? We imagine there will also be gaps that might surface in the literature, indicating interesting questions that lack adequate evidence to say that something is true.

That stand-alone piece should be very helpful

Cecilia Garibay

Q: Long-term Impact on Visitors

• Regarding the summative evaluation, one of the things that I find interesting about summative work that has been done on museum exhibits that relate to things like conservation is that when people first walk out of an exhibit they have a pretty good understanding of conservation and are even motivated. But a year later when they are interviewed, they have virtually no retention and it didn't really move them to go and do much of anything. Is there a plan to work with not just people walking out of the gallery that day, but summative research after that? I think that's one of the nuts that museums haven't cracked yet. • **Scott Sampson**

• It is not a large piece, so it's not like it will be the bulk of the summative, but there is a piece where there will be follow up. It will only be six months later. This is one of the conundrums of funding. You get funding through the end of the project when your deliverable is done, whether that is a developed exhibit, a training program, or the like. There typically isn't money built in to do a longer term evaluation, so it is hard to know what happened a year or two years later. The real dilemma in the field in general of informal learning is that we don't have the funding structure to do those longitudinal studies, but there is at least a piece of that. • **Cecilia Garibay**

to the field. Eventually it will be part of the deliverable at the end of the project that will be for the field, and will likely be some sort of publication. This will be the first time that there is any kind of comprehensive synthesis of the literature.

In addition to adding to the body of knowledge of the field, that literature review will also help us identify some of the interesting research questions that we might want to pursue more deeply. Those questions are of interest to the field, but also will be helpful in terms of what this project is trying to do. Right now we are planning what we are calling "Diorama Studies" at two places, The Field Museum and the Denver Museum of Natural History. Those are the sites where we will pursue those identified questions and see what we can discover. We don't know what those questions are yet. We might want to pursue the same set of questions at both locations, or we might have the ability to pursue different questions at different locations. It will depend on what information we gather and what questions emerge.

The final piece that is part of the research component is the pre- and post- of the actual experiences here. There are three clusters of dioramas that we did some pre-work on before the museum closed. We did research with visitors coming in, typically families but sometimes dyads of adults. We did observations and interviews of their experience at specific clusters, so it was a much deeper take than we did at the front end. The plan is to do an analysis of that data, looking at coding behavior, ways that people responded to them and so forth. Then we will do a post-study after the gallery opens with those same clusters, after whatever interventions has been conducted. We will then be able to compare what the difference is between them and to what degree some of these particular interventions may have shifted or influenced what the visitor experience is like, the kind of conversations they have, and what they take away.

That in a nutshell is what we're going to be up to in terms of the research and evaluation component of this project.

MOTIVATING VISITORS TO ACTION

Taking an Action Step in the Gallery

• Some of the reading that I've started to do addresses this question that Scott raised. There is a lot in the literature about moving people up the continuum from ignorance, to awareness, to understanding, to commitment and to action. Action is at the very peak. A lot of people who haven't done a lot of exhibit work are under the impression that if they just do a good enough exhibit, that's going to change people's actions. That's usually impossible because the most powerful things that motivate people to change their actions are things in their own lives: the opinions of those people they live with, their

family members, their friends, their experience in nature. In general, that's what gets them to change their behavior.

Something I read recently said that if you can provide the opportunity for the visitor to do some sort of action in the exhibition, make some sort of commitment and do something, even if that something is relatively limited and small, if you get them to take that first step before they go out the door, they're more likely to continue that afterward. We're thinking about this in our own exhibition that we're planning. We want to put in a lot of opportunities for people to say, "Okay, I'll commit to that, I'm going to do that." And then we'll aggregate the data later as people were talking about. • **Matt Matcuk**

Example: Congo Forest

- That reminds me of Congo Forest in the Bronx Zoo, where as you exit the exhibit you choose where you want a percentage of your admission to go, whether gorilla research or land acquisition. • **Stephen Quinn**

Action Precedes Beliefs

- In the literature, Dorothy Holland has done a nice study on environmental activists, and it's her contention that it's by being an activist that you change your beliefs. You don't change your beliefs and become an activist, it's the other way around. It's by being involved and participating that you really change who you are. It's an important piece to incorporate, but I don't know how museums can do that. It's an important piece to consider. It's the participation that matters. • **Doris Ash**

Example: Spend a Dollar, Save an Acre

- One of the things I want to do in our exhibition is a big tabletop of Peru made out of LEDs, and you can purchase your acre, you can adopt an acre. You put your credit card in and bing! Our program has managed a protection rate equal to two acres per dollar over the last eleven years, and our folks work mainly in Peru. I thought, that would be the first time I ever had an opportunity to feel like I had directly contributed to helping anything if I could just spend a dollar and save an acre. • **Matt Matcuk**

Tapping Conservation Ecology Research

- There is fascinating research coming out of the conservation ecology field that I think we are definitely tapping into. I think there are a number of ways that you can really create an experience that gets people to face that muddle. There has been a lot of research that talks about the social norm, what's acceptable, and I think that's another piece that we're looking at, to figure out how to do that. • **Cecilia Garibay**

From left: Scott Sampson, Stephen Quinn, Peter Kahn

Diorama Meta-dilemmas

The Meta-dilemmas

- Visual representation of science, biodiversity and dynamic processes
- Climate change
- Community
- California and Place

Kathleen McLean

INTRODUCTION TO META-DILEMMAS

Overview

Kathleen McLean

I want to give you an introduction to our segué into some small group work. We have articulated "The Diorama Dilemma" in our NSF proposal. Since the proposal was submitted, the project team has spent a lot of time grappling with some big-picture questions. For example, regarding the place: is it possible to transfer the energy, love, and appreciation that some people have for particular places to visitors in the gallery?

We're going to break into small groups and ask you to consider and talk about some of these meta-dilemmas. You on our advisory committee because you bring experiences to the table that we don't have. Each group will have a mix of advisors and OMCA staff. We could have a conference on each one of these questions—they're pretty hefty, and they will overlap. We're going to give you an hour in small groups to think about what we need to focus on and how we might get a little closer to resolving these dilemmas.

You've touched on all four of these dilemmas already in our discussions. How do we avoid overpowering these beautiful dioramas with technology? How can we visually represent some of the ideas without falling back on the easy fixes or finding out that's not what makes people really excited? How do we deal with the scale of the issues around climate change? How do we include community? Each of these reflect a commitment in this project. Additionally, we are focusing on the notion of place and the power of place, which is an overused phrase. What do we need to be thinking about as we move into dealing with the idea of place?

Questions

INCLUSION OF CLIMATE CHANGE

- I'm interested in what the rationale is for including climate change. Have you already decided that climate change is going to be a big piece of what you're going to be doing in the new gallery or are you trying to decide that? • **Doris Ash**

- We've told NSF that climate change is going to be a piece of this. We have had several sessions prior to the proposal with museum people and with scientists, and some of you were in those sessions. Some of you said, "You can't do this without dealing with climate change." We took you very seriously and NSF responded very positively, and some of the money we received was stimulus money directly related to climate change. We

don't know to what extent we'll be dealing with climate change. One of our dilemmas is that what's really cool in the current gallery, as Douglas pointed out this morning, is the individual critters. That scale shift between global climate change and individual critters is huge. • Kathleen McLean

CONNECTION TO GOALS, CLARITY OF GOALS: A CALL TO ACTION AND STEWARDSHIP

- To my mind, the question that comes up before I can address any of these is, have you narrowed down or decided what your goals are now? Are your goals to inspire a sense of place? Are your goals to get people to act to protect the environment? Are your goals to build a sense of community? Those goals will largely dictate what we do here. Maybe you don't want to say yet, but if you've actually come to decisions about where you're headed, that would be important information for us to know right now. • Scott Sampson

- We have said that we do want this gallery to have a call to action. I think you were the one who posed the question to us during a session when our board chairman was here: How strong a position of activism is this museum ready to take? When we submitted the grant we did say we want people to feel a call to action knowing, as Matt, said that there's a range that we're going to achieve. But we also know that we're in the Bay Area, where a lot of people do feel a sense of activism around this.

  So we do want people to feel a sense of: I can be a part of the solution, I can be part of the conservation effort, I can be a steward of the environment. Our theory about this is that the way to get there is not by wagging our finger at people but that creating a strong sense of place, having a strong sense of place, having a strong emotional connection to California, understanding that what people think about what is happening in the Amazon or the North Pole is happening right here, and really seeing the stories of people in these places and what they're doing to make a difference will help create that emotional attachment. I think we want all of those words that you have all used: the sense of passion, awe, beauty, but also concern and urgency. I think our methodology to get to this sense of stewardship and action is more of an emotional one than a didactic one. • Lori Fogarty

MODULAR, CHANGEABLE EXHIBITS

- How open are you to modular exhibits or changeable exhibits and updating information? • Stephen Quinn

- We're very open to these ideas. We're asking you to help us see in new ways the frame that we've created for ourselves in new ways. What comes out of these two days may be, "Look, you don't want to go there,

Guidance in Homing In on Promising Paths

- This is the kickoff meeting. The team has been spending a lot of time articulating the questions, but we want to hear from you how you think we should home in? What's realistic and what's unrealistic? Where is there some synergy among these four meta-dilemmas? We're standing at the crossroads with thirty paths out there. We're asking you to help us figure out which paths we should take first and which paths we should avoid. We're casting a very wide net here, and this is the broadest we're going to be. From here on in as time passes and as we spiral down into these questions and get things out on the floor and talk to visitors we are going to be focusing and narrowing our choices. • Kathleen McLean

Visually representing science, biodiversity and dynamic processes

We plan to use diverse data visualization techniques juxtaposed with dioramas to reveal change over time.

1. What issues arise in the shifts from the scale of small communities in the gallery to scales related to the Bay Area, California, nation, or world?
2. Is there a conflict between juxtaposition of dynamic aspects of visualization ant he static nature of dioramas?
3. What would be really essential to visualize about California's environment, landscapes, biodiversity, anticipated changes related to climate change and other human impacts?

Group Members

Advisors/Guests:
Christopher Cogan
Dan Rademacher

OMCA Staff:
Carson Bell
Christopher Richard
Mary Jo Sutton

but you really want to go here." • **Kathleen McLean**

NONNEGOTIABLE FACTORS

- Because you are committed to certain things, is there anything that is not negotiable? • **Julie Johnson**

- Yes: California, dioramas, this place, community. In fact, I think all four of the topics of these dilemmas are not negotiable. It's a matter of scale. How far do we go with climate change? How broad do we go with our community participation? The word "advisor" characterizes what we're looking for. Just give us your own opinions from your own experience. • **Kathleen McLean**

VISUALLY REPRESENTING SCIENCE, BIODIVERSITY AND DYNAMIC PROCESSES

Group Report

Mary Jo Sutton

The questions that we were asking dealt with the scale of the shift from the one-to-one of the diorama all the way up to the whole planet. We looked at the concept of the juxtaposition between static dioramas and media. Then we asked really quickly at the end, what are the things that are essential to visualize in the gallery?

SCALE: FROM CLOSE TO FAR

A main theme that kept coming up was that famous Eames *Powers of Ten* movie, where you're on the ground and then you're up ten feet, a hundred feet, a thousand feet, miles. We wanted to go from far away to close up. You might have to segué from a camera looking at something you can actually see to an animation or something more abstract, or a Google Earth photo from space.

GOING SMALLER TO THE MICRO LEVEL

All of the scales seemed to be pretty important, including starting not just with a one-to-one scale but going smaller. You could go down and look at the ring on that bee or that butterfly.

GOING INTO HIDDEN PLACES

We talked about looking at technology not just in terms of computer visualization but using cameras in other ways. Imagine going inside some of the burrows and seeing the animals or the critters that are in the burrows, looking around 360 degrees with the camera inside the burrow.

DOLL HOUSE SCALE PSYCHOLOGICAL IMMERSION

We also talked about getting immersed by looking at something at a big scale and getting immersed by looking at something that is like a doll house scale. Both sort of take you away psychologically versus getting immersed in a place that you can walk in and have all around you. We were really looking at how the brain gets captivated through imagination.

GETTING AROUND THE MAP ISSUE: STARTING WITH A PERSONAL REFERENCE POINT

We talked about using visualization to zoom from a reference point that people would know, like their school or their backyard, to maybe the watershed or the region that we're talking about. If you show somebody a map, people don't read maps and don't understand maps. What do you do if people don't understand maps? We don't know. But the idea was starting with a place that you know as your place, and working out from what you do know.

Christopher had this really nice idea of starting with what school a kid goes to, then walking them home visually somehow, and then spinning off the watershed. It's that idea of starting with a specific place that you know to a place that you don't know, going from the known to the unknown.

SLIDING THROUGH TIME

We talked about the Mannahatta Project and the idea of technology being a slider of time so that you go from 400 years ago to now or 200 years ago to now. We talked about that slider of time also being linked to place and space in time, so if you slide back in time you can go back one year and do a season. You can do a whole ring around the Central Valley, from green to brown to green to brown in a year. You could do the Pleistocene to the next era and find out what was here and what could be here. We talked also about Native American land practices and how much to show of that historically (the bay was filled in and the hills were used). We also talked about recreating the bay edge where the biomes are, 200 years ago to now. There is a lot of that data and we could do that.

USE AND PLACEMENT OF MEDIA

We started to get into how much media you show in the gallery, and how close to the dioramas, but because we are going to talk about that

Visualization group

VITAL SCENARIOS TO SHOW

We also talked about the issue of scenario modeling. If you have to show something, what is it you have to show? You have to show sea level rise. You have to show urban growth and habitat loss. You have to show protected places. There are a million acres now in the Bay Area, a million projected, what are those areas going to be? What is the future? It's not just watching a movie of unfolding disaster, there has to be positive stories. The growth of the wind farms with the growth of the dead raptors. What about the icon species? What's happening with the Spotted Owl or whatever else we think is a famous icon? And the wildlife sightings: What's happening around the Bay, who's doing seeing what, and who's doing what? I love the map Dan showed during his passion statement of all of the activities around the bay.

tomorrow, we tried to hold off on that.

AUGMENTING REALITY

There was also the idea of augmenting reality, looking at what you can see and then taking that a step further. Christopher mentioned that in the New York Subway you can hold up your iPhone and look and see where the exits are, and it will tell you which exit goes to which street. Maybe there's a way you could look at the dioramas and see what the animal is or what else you could see if you looked someplace else.

ANIMATED PLANET SPHERE

We talked about the science-on-a-sphere kind of Magic Planet animation (Chabot), which gives you a sense of the whole world in one view.

OUTDOOR WALK CAMS & DIORAMA CAMS

We talked about actually walking outside with a camera and having that show up here, and using live Web cams as data. If you see a camera shot of the diorama itself, you see people there too, and then pan out to the whole watershed perhaps.

CHALLENGE: USE OF VIDEO WITH DIORAMAS

The difficulty is trying to go from this 3-D view to the canned view of Google Earth, and that conflict of the static media with the animated or not animated canned media. Anything that is going to take your eyes off the bird in the box will take your attention away. That was a question for us. If we have media next to it, the bird in the box is going to disappear for at least a few moments, long enough for the baby to drown. If you have videos it has to show you something you can't see otherwise.

Questions and Comments

DEALING WITH RAPIDLY CHANGING TECHNOLOGY

- Did you talk about how the technology is going to be so out in front of us? When I started my research five years ago on one project, the technology now has caught up to where we needed it five years ago. That's going to happen here too. Whatever you look at now is going to be old in three years. I don't know you get out in front of that except to be very aware that it's going to happen and be willing to shift in mid-stream. Maybe it's not spending all the money right away and having some left over. **• Doris Ash**

- The only thing I can think of there is that if you choose media that are really appropriate to whatever the experience or message is that you want to provide, that will always be valid no matter what the advances are. To the degree that you point to the technology, that's where you start to get really at risk of looking dumb in two years. **• Matt Matcuk**

- I don't mean it for that, I mean it as a way to enhance the work you're going to do anyway. It's not technology-based, it's just having

a sensibility around what the technology is going to be able to in the future. It's not a better typewriter, ever. You were talking about videotaping a person in front of a diorama and then videotaping how it could be outside. That's sounds kind of exciting, and I'm sure there are going to be better ways of doing that. • Doris Ash

- I want to weigh in on this technology issue. I think there are problems that I'm hearing. One is the perennial one, which is how to keep ahead of the technology. That's a hard one that requires thought and picking the technology very carefully. I think the point is well taken that no matter what you do, if you get the right match then it doesn't matter if you get outdated. But I do think there are also ways that if you get the right technology and the right space and get far enough ahead, you can actually be two to three years okay instead of six months dead.

  I face it all the time. With the research I showed you today, the plasma window study that we did, I started trying to get funding for that eight years ago. We put it in place five years ago, the study took three years to do, and now I'm reporting on it. It might look a little old, but it's not totally old because eight years ago it was really cutting edge, and the camera that we used was a $100,000 camera from the university that we put on top of the building to get the real-time view. The same with the robotic stuff that I'm doing. I'm trying to collaborate with research labs in Japan in order to be far enough ahead on the technology so that by the time the psychology cycles through three years later I'm not outdated. I think that's an important issue. • Peter Kahn

DIFFERENT KINDS OF IMMERSION

- Did you talk about how you might make this more immersive? There are lots of different ways of doing that. None of them are probably cheap yet, but even things like creating nighttime, or creating storms. Or going to the next level, you put a screen in front of it and project on the screen, matching to what is in the diorama, and then you bring it to life, you animate it. There's a number of different options you could use to make these environments more immersive. • Scott Sampson

- Ray Stevens did some interesting work when he was at the Exploratorium about people doing the activity and then coming back behind the exhibit and seeing themselves doing the exhibit and taping that as well. There's software that does that and it probably works a lot better now. That's a way of having an immersive experience, and it really invites people to reflect on their own experience. • Doris Ash

DIFFERENT KINDS OF SCALE

- We didn't get into the technologies of how to make this more immersive, but we did get into the idea in the sense of scale, that there are many kinds of scale that could be discussed in relationship to that room. One is the one-on-one scale of the bird in the box or the insect in the grass, but there's also the scale of: Are you in the scene or are you standing away from it looking at it from a few feet away? We did talk about the one display area, the redwood forest. If you had a walkway through that you would literally be able to walk into that display as opposed to looking at it from five to ten feet away. So there's three different kinds of scale. We have to figure out, what is scale? Getting immersed into the display is a scale. • Christopher Cogan

- The other thing we talked about is projecting an actual diorama into a Google map and then trying to position that in terms of where you are from and putting a real place location on that. • Dan Rademacher

THESE AREN'T DIORAMAS: MAKING THE SPECIMEN CASES MORE IMMERSIVE

• I think it's interesting that we're referring to these exhibits as "a bird in a box." Technically, those aren't dioramas. They are really habitat groups. In achieving that sense of place and immersive surround, a true diorama has a full curved background painting with an enclosed lightbox, and you view through this window where your vanishing points are concealed so you have this illusion of a world beyond. I think the closest that you come to that is that central redwood forest group, and there are three or four other dioramas that are set into the wall. So one would almost make a case for having these as moveable elements that you could shift and build scenes around in a certain part of your gallery space. • **Stephen Quinn**

Visualization group

WORKING WITH THE LIMITATIONS OF IMMERSIVE TECHNOLOGY

• What I'm hearing in terms of simulation is that the better you get, it the more immersive it will be, if I'm using "immersive" correctly. I think it has been used in different ways by different people here. The more you get something like the *Startrek* holodeck, the more effect it will have. In my research program, when I'm looking at the data across the different technologies and the psychological effects that are emerging from that, the better fidelity you get, the better psychological effects emerge. But they still fall short when you compare them to actual nature.

That's a lot of what my research is about. It's not just being able to show what you get, but being able to get scientific data on what's not there. And then the technologists can always come back and say, "Yeah, but just give us another $5 million and I'll be able to solve it." There's no answer to that. The technologist might be able to do that, but the question I've been wanting to put on the board then is, what are the benchmarks that new technology is going to be measured against? Do the benchmarks have the deep connection to nature, the deep ecology and the psychological and health benefits? What's the range? It's not just fidelity and number of pixels per square inch that are the benchmarks. If you get the right benchmarks, the technologists have to be responsive to that.

What I would put out as well to the museum community is that as you get increasing immersion and increasing fidelity, from my research I would argue that if you did any psychological research on it, you would still end up far short of the psychological experience. Then the question you have as exhibitors is, do you try to put that shortcoming out on the table for your visitors, or do you try to hide it? I would argue that you need to put the problems front and center as an educational tool. As you get more immersive with the technology I think it's the way to go, but you're going to have this problem. That's the shifting baseline problem as well that I was talking about. • **Peter Kahn**

• But it almost seems like if we put the problem out there, it might be an incentive for people to go out there and try the real thing. • **Julie Johnson**

• You think this is cool? Try the real thing. • **Kathleen McLean**

• Peter's point is something we're looking at in the other galleries, and the research we've done is this idea of transparency. What really fascinates people in museums is: How did you do that? How did you get that? Is that real? Who's talking on this label? I think carrying that into the technology, where you're not trying to fake it, is a good idea. • **Lori Fogarty**

DISTINGUISHING/CAPITALIZING ON WHAT THE MUSEUM OFFERS (VERSUS PBS OR REALITY)

- Yesterday we got a report from some focus groups of some groups previewing some exhibition concepts. One of the responses that came back was, "Why should I go to the museum when I can get it on PBS?" You (Peter Kahn) are saying you've got data showing that seeing it on PBS isn't the same as this, and this of course isn't the same as that. But how do we answer that question in terms of getting people in the door using your research to say, "You can't get this on PBS"? • **Christopher Richard**

- I think you've got to identify what you do best, uniquely from anyone else. We spoke about this during our session. You have the opportunity to show the real thing, or the illusion based on this intersection of art and science, done so well that it duplicates nature so closely that you then encounter the real thing face to face. • **Stephen Quinn**

- You can get the information, but you can't get the interaction with that information. You can watch it on the TV and think about it, but here you can do something different. When we teach language we have something called TPR, Total Physical Response. When we talk about a table, we touch a table. When we forget the word for table, we touch a table and remember it. Connecting things with physical action will help you retain the information. I'm sure it doesn't just work that way with language, I'll bet it works with everything. • **Richard Bugbee**

- I also want to point out that a lot of the audience that you're talking about reaching doesn't watch PBS. We have to get real about that because it's a particular audience that watches PBS. • **Carolyn Finney**

- But when we did the focus groups, the older member groups said PBS while the younger urban groups said Google: "I can get that on Google. I can Google that." • **Lori Fogarty**

BENCHMARK: VISITORS' COMFORT LEVEL WITH NATURE

- In our gallery surveys last fall, we specifically targeted people who hadn't been to our museum before. Some people said, "How did you get it to be so realistic?" Other people said, "It's great to be in nature." We can sit here and have non-nature, but there are parts of it that are a lot like nature. We have to be more fluent in the spectrum of understanding what nature is, or what nature-like and non-nature like is because there is a comfort level.

  The question was asked, what are the goals? And there was the idea that you can get ahead of technology, but what are you getting measured against? Can we measure people against their comfort level with nature itself, their familiarity with what we have here and their willingness to find out more, based on their comfort level increasing in the gallery? If there are certain pieces of nature, like the sounds or some of the beauty that comes in the gallery easily or naturally, then there's a way that the outside piece may not be so scary or foreign. It's not just virtual or not virtual, it's what pieces go in and go in comfortably. • **Mary Jo Sutton**

Group Members

Advisors/Guests:
Matt Matcuk
Stephen Quinn
Peter Kahn
Richard Bugbee

OMCA Staff:
Gail Binder
Lindsay Dixon
Karina White

California and Place

We hope to instill an appreciation and curiosity about these places for visitors

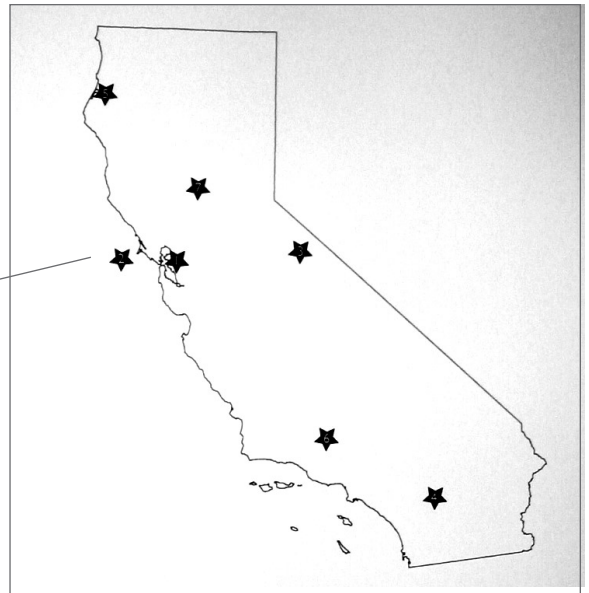
1. What do you think of representing California via a few places?
2. What questions do you have about this approach?
3. What is strong or weak about it? Opportunities?
4. What about the scale shift from biome to greater California? How to bridge that?
5. What about the viability of creating "sense of place" in the gallery?
6. What about statewide issues (e.g., water)? What is your sense of the state of California, particularly in relation to its natural environment?

CALIFORNIA AND PLACE

Group Report

Stephen Quinn

There were various maps in the first room we visited, and I think there was consensus that we liked map number three, which had a range of seven sites, more than any other map.



Places # 3

1. Oakland
2. Cordell/Farallones (& maybe Channel Islands)
3. San Jacinto
5. Klamath/Siskiyou
6. Tehachapi
7. Sacramento Valley/Sutter Buttes

NATIVE AMERICAN SITES

Richard mentioned that there was no tribal map of California and there were sites that he felt were important, such as Mt. Shasta, which was not one of the sites (note: it is an alternative). There were some other sites that he was aware of that had significance to Native peoples that should be included.

SENSE OF PLACE IN THE GALLERY ITSELF

We also discussed not only the sense of place in terms of determining what places were going to be exhibited in the gallery, but also the sense of place in the gallery itself. That led to talking about immersive exhibits.

A HOOK: A WOW MOMENT

We talked about the hook of a wow moment, inspiring people to care about the environment or be moved to care. This could first be stimulated by a beautiful encounter, a kind of wow moment as you encountered either the gallery itself or the six or seven individual sites. Think of a beautiful sky, a flight of geese, encountering nature in all its splendor. Those may be

Place group studying California area map alternatives

supported by the collections, these individual habitat groups.

DEPICTING ACTUAL LOCATIONS & CONSEQUENCES OF HUMAN ACTION IN THOSE LOCATIONS

There was a discussion about using actual locations in the creation of these dioramas. Rather than generalized ecosystems or scenes, they would depict an actual topographical feature that people could visit in the field. That might serve as a point of reference for determining what might appear in the future and also referencing it in the past.

We also noted that if these ecosystems you are seeking to highlight are depicted using real places, that would facilitate talking about success and failure stories. There could be a function where people could also choose actions, using natural resources or whatever, that might lead to deforestation or preservation. If I drove my car and used gas versus riding a bicycle, that would lead to environmental changes that would degrade the habitats depicted. You would see how you as an individual could influence and impact the environment.

RECREATING A SENSE OF BEING IN A PLACE

We talked about what museums uniquely offer, the display of actual, real specimens via the habitat groups in the context of this larger immersive experience, which would seek to recreate a sense of being there, a sense of place.

THE FUN FACTOR

We talked about the fact that thought the exhibit really needs to be meaningful and worthwhile, it should be fun. People come to the museum with their families or whomever to have fun and be engaged.

Matt Matcuk related the experience at The Field Museum with the Pirates Exhibition, developed by a for-profit group, that involved big tableaus and pirate mannequins, complete with a depiction of sawing off a leg. A lot of the staff felt this was the worst kind of Disney-fication. They did a survey with visitors asking them to identify on a scale of 1 to 5 whether they thought the exhibit was pure entertainment (1) or pure education (5). The average rating was 3.7, so more thought it was educational than entertainment. Their favorite things were the tableaus and dioramas, but

NGA = "IN THE PLACE"

The "nga" ending to a word in the native language means "in the place." For a modern example, "carnga" means "in the car." Many place names in California have this name ending, for example, Cucamonga, Topanga. • **Richard Bugbee**

Place group

SEATTLE CAFE EXAMPLE

In Seattle there is a cafe where people can upload their photos onto screens in the cafe and they then become part of the place. • Peter Kahn

MEMORIES OF PLACE

You could do a retroactive exercise. Think of a place in nature that you knew as a kid. Can you go back? No, because there's a freeway there now. We've all had losses. • Peter Kahn

WHAT MUSEUMS OFFER

Museums offer authentic objects and actual specimens in a unique, immersive environment that includes the architectural space of the museum, the only thing you can't get elsewhere. • Matt Matcuk

Place group

they felt they learned most from the cases and labels. It was okay if they didn't learn, they had fun. Those that wanted more information could turn to the cases. When visitors at The Field Museum are asked to identify their favorite, they always name immersive exhibits.

LIVING VISIONS OF SUCCESSFUL CONSERVATION

We also discussed the significance of people encountering exhibits that deal with environmental issues that have been championed and expressed as causes in the past and are now living examples of this vision of working toward preserving them and caring for them.

INCORPORATING VISITORS' PASSIONS, VOICES, PHOTOS

There was also talk about the immersive quality of this meeting, which was a compliment to the organizing group. You first engaged us and asked us about our passions and how we perceived the natural environment and why we care about it. There may be a structure within the exhibit where visitors would be interviewed and have their own voice and their own concerns and feelings displayed within the exhibit. Obviously most of us do care about the environment. There was the thought that this might appear on an LED screen. Visitors could take photographs out in the field and send them via the Internet back to a repository in the museum. They would be able to take action by contributing to the database.

A SENSE OF REVERENCE

There was the thought that in returning to this relationship to place, the exhibit may convey a sense of reverence for the environment and the natural world as often expressed by aboriginal beliefs—this connection with our origins that we all share as organisms ourselves.

THE BIG PICTURE

There was a concern that with six or seven special places, how would we return to the big picture? Does that provide challenges in talking about the whole of California as well? I don't know that we resolved that.

THE STORIES OF ELDERS

We were all engaged by Richard Bugbee's stories of his experiences and relationship with his elders and methods of conveying and understanding the natural world through these elders. We thought that voices and stories are an important way to relate people to the natural world in very special and unique ways, just in terms of learning from these stories that are passed down. We briefly talked about learning from our own experiences in nature.

FEAR AND HUNTING

We also talked about fear and hunting.

COMMUNITY

Group Report

Carolyn Finney

We talked about a number of things, and I'm put them in some sort of order.

UNDERSTANDING THE MUSEUM CULTURE FIRST

All of us talked about the importance of doing an in-house inventory of the "museum culture," as Amy put it—assumptions, understandings, agenda, and intentions—before going out. This isn't something where you sit down and have a nice one hour talk and you all feel kind of uncomfortable and dumb. In some ways it's an ongoing process and would have to be revisited. There is a set of assumptions and fears, and there is an agenda as well, and there is a need to be clear and up front about that.

COLLABORATION/COMMITMENT DATING METAPHOR

When you're talking about collaboration, it's also about commitment. We kept using the metaphor of dating and relationships. In terms of commitment, how much time are you talking about? We discussed how many different groups are you talking about collaborating with, and I believe it was Julie who said you really do need to start to think about what that looks like when you start collaborating with different community groups and building relationships.

STRENGTH AND DURATION OF COMMITMENT

When you're clear about what your inten-

Community group

Group Members

Advisors/Guests:	OMCA Staff:
Doris Ash	Amy Billstrom
Carolyn Finney	Douglas Long
Cecilia Garibay	Suzanne Pegas
Julie Johnson	

Community

We plan to work with a variety of communities and visitors in a codesign process for selected elements in the gallery.

1. Can you share things you have learned about fruitful collaborations from other projects?
2. What are the strategies for creating and maintaining authentic and meaningful relationships with different constituencies?
3. What are things to keep in mind, pitfalls to watch out for, either when entering into collaborations or during the process?

ADDITIONAL POINTS

There were a few additional points:

• In doing this collaboration, what are we asking people to do and why? We need to be clear about that and prepared to answer that question.

• The word "outreach" may not be the best word to use. It connotes a one-way relationship, which is not want we're looking for. A work that I think we will look into is *Funds of Knowledge* (Gonzalez, Moll, Amati, eds.), which Doris Ash suggested. It talks about the knowledge that's available in different communities that has significant value. That is something that we are going to be getting, and we should look at it as a fund of knowledge as we're approaching these groups and working together.

• It is going to be a really scary process. If we're reaching out to other groups and saying we want them to be part of creating this, then there are things that we may have to let go in order for that collaboration to be authentic. If we ask what we are willing to give up, that's a scary thing to do.

• We might need to get some more help in the beginning of the process, hiring people from the community to help mediate conversations and/or help us to be more comfortable conversing in cross-cultural spaces. Those are some skills we need to work on, otherwise we won't be able to connect. • Suzanne Pegas

tion is and your commitment is, how long are you willing to hang in there? Maybe you've been with someone for a couple of years, but suddenly they're having problems and now it's getting difficult. Do you drop them or are you in it for the long haul, and what does that look like and what does that mean in terms of responsibility?

COMMUNITY RELATIONSHIPS EXTEND TO ENTIRE TEAM, NOT ONE STAFF ROLE

We talked about the issue of cultural competency. Amy mentioned that there is going to be a person hired who is going to be a community liaison, and that's great. It's important to remember that it's not one person who is responsible for that relationship. That one person is just part of a team.

A RECIPROCAL RELATIONSHIP

We talked about the issue of identifying needs and building reciprocity, so it's not just going in and getting what you need from the community but actually taking the time to consider what they want and what it means to have a reciprocal relationship with them.

SCIENCE WITH A BIG "S"

We talked about big "S" science: It's not about dumbing it down or assuming that people don't have some knowledge. We had a lot of metaphors for this. I think Doris mentioned a spiral, and we also talked about pebbles and walking across the water. There are ways in which to not dumb it down. People learn by taking the steps they need to get there and you have to figure out what that is, what those steps are, and that's one thing you can collaborate on.

CLARITY AND TRANSPARENCY

We talked about words and meanings that are used. When you talk about collaboration, in some ways it's true that from the beginning everybody sits down and defines that. In some ways this group already has a set idea of what they want, partly because you have a grant and have taken time to think about it. The point is to be absolutely clear and transparent about that and about everything from money to commitment. All of these things are going to come up, and don't think people don't know it when you go in. Many times they might actually have questions to ask you about some challenging issues that you need to be willing to answer.

IDENTIFYING KEY CONTACT PEOPLE

There is identifying key people. Some of it is about going into communities and figuring that out. You may already have some of those relationships, but you need to also recognize that there are power dynamics within communities. When you identify what may seem like great people, they may not be the best people to give you the full range of thought and perception and understanding about what your project is. That power dynamic can be anything from gender to race to age. It goes down the line in terms of what you need to be aware about when you're building these relationships.

ADDITIONAL THOUGHTS/IDEAS/RESOURCES FROM THE COMMUNITY GROUP

- Education staff are brokers, boundary crossers
- Explore words and meaning. What do they think you mean? Develop shared vocabulary.
- Explore notions of science (science as "truth," science as a collaborative process, unpacking what science is).
- NRC Informal Science and Learning Environments: sciences as a cultural concept, issues of diversity.
- Concrete example: Science Museum of Minnesota project with Hmong and Somali (no word for "science" in Hmong; Somali feel school is the only place you can learn). Teens trained in group facilitation, they decided where to go and who to talk with. Think about youth as co-facilitators.
- In trying to draw diverse audiences, think about their needs: admission fees, transport, etc.
- What was learned from the PISEC project regarding museums and communities? After three years they held a 2-day facilitated experience with project staff, museums and community organizers & learned new things about partners. Do some of that up front in this project.
- Will the community relationships endure once the grant money is gone?

CLIMATE CHANGE

Group Report

Carolyn Rissanen

We didn't do this by going through the questions one by one, but we did try to address all of the questions. We starting with an overarching question: How do you relate the dioramas, such as the ones we have here, to climate change?

COMPARATIVE STUDIES/PHOTOS OVER TIME

We talked about historical surveys and then resurveys. An example would be the Grinnell studies at UC Berkeley, taking these hundred-year-old photographs and showing the changes over time. There's a study at UC Santa Barbara of tidal pools, a fifty-year study of the species change in tidal pools.

BIG THERMOMETER: GRAPHIC TEMPERATURE CHANGE

We had the idea of using a big thermometer, something that's graphic so that people can really grasp it. What would happen at a certain temperature? What would happen to the snow cap? At what temperature are the sea levels going to change?

WHY CARE? TIE TO CALIFORNIA ISSUES

We then asked, why should people care? We need to tie it to California issues. Water was the one that came up first. Show the types of

Climate Change Group Members

Advisors/Guests:	OMCA Staff:
Norman Miller	Rebekah Berkov
Lisa White	John Perry
Scott Sampson	Carolyn Rissanen

Climate Change

We plan to focus on the effects of climate change throughout the gallery.

1. What are strategies for connecting the natural sciences collections to climate change stories and science?
2. What are the specific stories for California? How can we particularly engage our local audience with stories that personalize this often overwhelming crisis?
3. How can we communicate effectively about climate change without alienating our audiences from caring, and/or making them feel hopeless?

CHANGING YOUTH VIDEO SPACE

An idea people liked was to have a small changing space where we have youth videos and media. Many youth have stories of what they have done or what is happening in their community, and they're really up on doing video. We could change that monthly and have a different group showcasing something they're doing. We thought that might be a good way to catch people's attention.

SIGN UP FOR CHANGE

We talked a little about the idea of getting people to sign up for change before they leave the gallery.

Climate Change group

impacts that we may see through time so you can get to people's awareness of what might happen, and then you ask for a response.

IMMERSIVE, GRAPHIC, EASY TO UNDERSTAND

How can we show the before and after immersively, graphically, so that a child can understand it?

COMBAT BLEAKNESS WITH ACTION

It seems very bleak. How do we build in hope? The response was that you bring hope through action, otherwise it becomes hopeless, so there has to be action as part of this discussion. Have a separate diorama set on action, focusing on things like the clarity of Lake Tahoe, things that have happened, things that are working. We can also motivate people to do things at their schools and in their community.

MONTEREY AQUARIUM: BALANCING BUMMER WITH ACTION

Look to the Monterey Aquarium for a balance, where they show the bummer stories but then show what you can do. Then there was the parenthetical question, how successful is it in people actually bringing those messages home?

CHALLENGE: THE BIG, COMPLICATED PICTURE

Climate change is such a big subject, how do we explain it so people's eyes don't glaze over? We talked about having levels of content. You'd have a big picture label, then you could get a little more information and then a little more information. It's a sophisticated subject. Maybe it needs something like a seven-minute video that hits you and gives you the big picture before you try and digest more about it. We really didn't answer that question very well.

DIALOGUE, QUESTIONING, SYMPOSIA

What about having a dialogue? John's suggestion was that it is such a big, difficult subject that it's the type of thing you want to be able to talk to someone about and say, "I don't get this part." How do we do that? We need to include programmatic parts to this by having symposia or having scientists here on a certain night so that you can come and talk to somebody about those kinds of issues.

A GRAND TIMELINE

We need to show scales of climate change and

use the geologic past and come up to current and future models. Norm had the idea of having a big timeline that shows the change in species, the change in sea levels, the change in water levels in the Central Valley, to show how things have changed over time and how rapidly they've changed more recently. In our gallery because we go from sea level to high elevation, it's set up to use water and the shift in biomes as you move up in elevation. We're already set up in that direction.

ANTHROPOGENIC INTERFERENCE

What we need to show is not just climate change but anthropogenic interference. That is not a third-grade level term, so we changed it to "people screw it up" (which isn't third-grade either).

TAKING A STAND

Somebody mentioned that there was a recent survey that showed that only 30% of people believe climate change is really happening. We have to take a stand. We have to decide whether we are going to say as a museum, "Climate change is happening, we are a part of it," period. It's not whether 30% of the United States believes this is true, we have to decide that we're going to say that.

KEY CLIMATE-RELATED CHANGES & THE TIE TO NATURAL HISTORY MUSEUM COLLECTIONS

Then we asked, other than water, are there other things in California that really demonstrate climate change? The three main things are alpine changes, coastal changes and water, including things off shore. How you tie the collections in is that the collections in natural history museums are the basis for a lot of the research on these kinds of changes. They show how climate has changed and is changing. That's what's important about natural history collections.

THE LOCAL-GLOBAL LINK

There was some discussion about the big change in the polar ice caps over just the past five years. We started getting really global, talking about polar ice caps and things all over the world. We need to be global, but let's talk about it in terms of the shoreline of the bay. Maybe we talk about global things on video, but the exhibits talk about more global messages.

CITIZEN SCIENCE, OBSERVING CLIMATE CHANGE

We talked about citizen science and how that is another way to get people active. You're asking them to do observations and you can collect their observations. You can show what time of year birds are arriving in their gardens, you can show what time of year blooms are started to happen. That is starting to shift because of climate change. Not only does it get them more aware of it, but it also gets them out and observing in nature.

EMOTIONAL APPEAL

Facts and knowledge don't cut it, you have to reach people emotionally. Perhaps you have indigenous people telling stories of change and how they have seen things change.

A GREEN JOBS CENTER

There was a discussion about how we can be even more local and helpful. We talked about green jobs. Can we put a job center right there in the museum? People right now in this economy need help. It's a difficult time for them and even getting them to come to the museum seems difficult. What if we did something that was actually helpful to the community here at the museum?

A CHANGING GALLERY WITH HOPEFUL VISIONS OF A SUSTAINABLE FUTURE

I was at a workshop yesterday on how to foster behavioral changes, particularly around the environment. People were saying again and again that we have no images of what a sustainable future looks like. I started to think about the *Forces of Change* exhibit in the History Gallery. I wonder if there's an equivalent we could have in the Natural Sciences Gallery that would focus on what a sustainable future would look like from the perspective of many different communities. When you tour the History Gallery after today's session, take a look at the *Forces of Change* exhibit and try to think of some kind of a hopeful version that we could have in the Natural Sciences Gallery. • **Suzanne Pegas**

THE FUN THEORY

The Fun Theory came up (www.funtheory.com). It's something Volkeswagen is doing, based on the idea that people will change their behavior if it's fun. The one I've seen involves the staircase in the subway station. They made the stairs into piano keys. People normally use the escalator instead of the stairs, but once they turned the stairs into a piano so people could play music as they went up and down the stairs, people chose the stairs over the escalator.

MEDIATE BETWEEN SCIENTISTS AND THE COMMUNITY

We need to be a mediator between the community and the scientists and show them what the scientists are doing so they can understand how that affects them.

STAYING CURRENT

We also need to stay current. We all know we're opening in 20012 and things will have changed even by then. How are we going to stay current with what' happening?

Comments and Questions

COMPARATIVE STUDIES/PHOTOS OVER TIME

- Did you all discuss whether or not, as opposed to the museum creating a particular exhibition around climate change, you might create a space to bring stuff that others are doing on climate change here? There is a lot of stuff going on and some others have way more money. I don't mean that in a bad way. When I think of doing a really good exhibit on climate change, that could take your entire budget.

  There are a lot of other kinds of activities being done in museums and universities around climate change. Might you think about a space where you could showcase those? Then the conversation piece or the local piece is more of a programmatic piece that you develop. That way you are staying current by bringing in current work, but you don't have to incur the expense of changing your exhibition space regularly. • **Julie I. Johnson**

- Scripps would be a good place to go for that. • **Doris Ash**

Interim Discussion: Dreams, Ideas, Issues

THE POWER OF STORIES

Visitors' Stories of Place

- I had a dream and didn't remember it until I got a cup of coffee. I think it was about the power of story and telling a story or narrative. It cues off of what Carolyn said yesterday, which is powerful, that we all have our own story and we all can tell it, and having one person do it encourages other people to do it. What came to me as a reflection on the dream is that we're telling stories here.

  All of the boxes in the gallery are different stories, but they're someone else's stories, they're the "other." The people who come here have to be able to tell their own story. It's more than a post-it board, it's more than a box, I don't know what it is. The visitors have their own places where something happened and we need to tap into their places. I don't know how to do that, but I think it's at that level. There are going to be thousands of them, so how do you deal with that? People here were talking about deep ecology and deep sense of place. I think we all have it around place. • **Doris Ash**

- You could do that through a Web site. • **Scott Sampson**

WHAT STORY DO YOU TELL?

Stories/Messages Based on Hard Science

- I know that multiple voices and multiple personal stories are very important, but I think that science is very different from art and history. In other words, science uses direct observation from nature, tests hypotheses, gathers data, and then draws conclusions from that data in the natural world. I'm just thinking that the real messages we have to send are based on hard science, whether it's basic natural history or the data about where the environment is today. I wouldn't want to see that diluted in any way in terms of the environmental crisis that we are rapidly getting ourselves into. • **Stephen Quinn**

- This is a big issue for the team as well and comes up on every one of these kinds of projects. I would love to hear from other scientists around the table about what you think about that. • **Kathleen McLean**

- Where that comes from is that we've designed exhibits on Darwin, human evolution and biology, and there is always pressure to tell the creationist story as part of it. That's inappropriate because creationism is not science, it's based on faith and religious views. • **Stephen Quinn**

Dreams: Tales from the Unconscious

- We had an intense day yesterday and an interesting dinner last night, and hopefully everybody had a good night's sleep. I'd like to spend a little time before we get back into the day's work and ask you if anybody had interesting dreams last night. This sound so hokey and California airy-fairy, but in other symposia people brought up dreams that actually changed the direction of projects. Sometimes your unconscious is a great narrative wizard. • **Kathleen McLean**

New Guest: Jennifer Stock

- I'm Education Coordinator for the Cordell Bank National Marine Sanctuary, which is part of NOAA's National Marine Sanctuary program. We are going to be working with the OMCA on the ocean area, trying to feature some of the special areas of California that are really biodiverse with lots of marine life, and trying to focus people on the near-shore marine habitat. • **Jennifer Stock**

Native Waters Project: Science and Indigenous Stories in Parallel

- Bonnie Satchatello Sawyer has been doing some work in the Missouri River Basin with approximately thirteen different nations, looking at stories of water science and environmental science. Their project is called Native Waters. They've created an exhibition that's travelling through the thirteen nations, and now they're doing a project where they're working with elders and a few others in the thirteen nations and looking at ways to understand the natural environment both from the stories that are inherent in their culture as well as the Western way of looking at it. They are basically saying these are different ways of looking at and understanding the natural environment. They are working with a Native American who is a scientist and does a lot of environmental science work. That may be a group you want to tap into. • **Julie I. Johnson**

Resource

Hopa Mountain

www.hopamountain.org

Dealing with Creation Stories: from Native American to Judeo-Christian

- Let me throw out an idea here because I think this is something we're going to be struggling with: Many scientists might throw Native Californian origin stories into the same pot as Creationist stories, since neither are based on data and evidence. Do we say that's not science, so we won't deal with it? • **Kathleen McLean**

- But once you open that door, it's open. • **Doris Ash**

- Richard and I were actually talking about this very thing this morning, and he had a really interesting response. I said, "How would you feel if the scientific story of everything was being taught to your kids or the tribal kids in the science class, and it was taught as the overarching origin story as science tells it?" Richard said that they'd have no problem with that, that they can live with the two stories simultaneously and that's not an issue.

  The goal isn't to say science is right and this is the way we have to go. It's to say this is the way we understand the world right now to the best of our knowledge, and it's a myth. It's still a myth in the sense that we're just outlining the basics of it. We are still really in the dark. Compared to what we could know, we hardly know anything at all. So let's be honest about that and say, here's the world as science understands it, and here's the world from our scientific point of view, but that doesn't mean you couldn't include indigenous origin stories at all. But how do you do it? I don't know. Do you put them side by side? • **Scott Sampson**

- I was talking to Stephen Jay Gould about this. He received an award at the Exploratorium and came to the awards dinner but didn't want to hang out with all of the people, so he asked if he could just sit in my office and talk to me. His speech that night was about religion and science, and he said that the world pigeonholes these two things as separate and opposing, and in fact they've never been opposing. He said the deeper we get into understanding the science, the closer we get back to the origin stories about relatedness and kinship. Now we have the data to prove it in the genetic material. These metaphorical ways of expressing the world may actually be telling some of the same stories as science. NSF is funding several Native American science projects for this reason (see sidebar). • **Kathleen McLean**

- To me, our creation story kind of fits in with evolution because we believe that we're related to all the other animals, and in evolution all of the animals evolved and we kind of believe that. We believe that the first people were actually animals and then we were the last ones here, even though we

have a supreme being that put us here and all of that stuff. There's an order of things that came. We have this duality that we believe in, this way of thinking of it and that way of thinking of it. Even though they seem opposing, they're both okay.

I have an example from when I lived with the Aboriginals in Australia. The women believe they get pregnant by the spirits in different spirit places, and that's the father of their children, so their children are tied to those spirits. If you tell them, you know your husband really got you pregnant, they'll say, "We know." This is what happened and this is what happened and they're kind of in conflict, but they're both true. • **Richard Bugbee**

- I think we can learn to not be so polar in our thinking, that's it's either this or that. It gets back to that "and." It's this *and* that. • **Kathleen McLean**

- I recently overheard this wonderful conversation between this Okanagan elder and a physicist, Fritjof Capra, who works in the Center for Ecoliteracy. It was just wonderful. It was a public conversation and what they were able to do was find that synchronicity between these different world views, the scientific world view and the Okanagan world view of creation. There were so many areas of overlap and it was really inspiring to see that, going to your point of pulling away from the dualities and opposite ends of the spectrum. One of the areas that we explored at length was the area of language and how it's very difficult to translate these concepts that are not bounded by the English language. • **Rebekah Berkov**

- I have a friend who is a singer. He was going to sing this song and there was this one word in the song. He spent over half an hour trying to explain what that one word meant, and basically it was the only word in the song. • **Richard Bugbee**

- What if one's creation story is partriarchally derived and says something about populating the earth and dominating over it? What if it's Judeo-Christian? That's what we started with. What about the main one in this country? • **Peter Kahn**

- One of the things I love about journalism is that rather than trying to do be an omniscient narrator, I try to bring in all of the voices of people I'm talking to. It's based on conversations. If you're hearing from elders what their story is, and then you're hearing from scientists what the story of this place is, I feel like they're both kind of derived from the place where that culture came to be and they're derived from that landscape. You're not going to include all of the creation stories of every culture in the world, but if you're talking about a specific place and there are scientists who are researching it and there's a culture that believes it came to be in that specific place, then you can

Sticking to the Science Story

- We redid our big halls of evolution at The Field Museum and completed the project about three years ago. In the old version of that exhibition there had been a small section about different creation stories. It was really lame because it couldn't do justice to those stories. Those are too varied and rich and complex. When we redid the exhibition it was right at the time that Kansas was trying to force through a law that students would have to be taught creationism. It was during all of those pitched battles that we were trying to figure out how to address this and what we were going to do.

  It sounds kind of flippant and I don't mean it to, but we are a science museum and we're going to tell a science story. A bunch of us went to the Billy Graham Museum, which is really well done. They're not obligated to talk about evolution, they're telling their story. We're here to tell ours. That doesn't invalidate anyone else's. It allows for the duality that Richard is discussing. I think we do more respect to other systems by simply saying, here's who we are, we're scientists, we see the world this way and we're going to tell you about it, here it is. • **Matt Matcuk**

Making a Decision and Taking a Stance

- One meta-point I want to bring up is this whole notion of relativism. I teach science teachers, biology teachers, and it always comes up: If we open to creation myths from other cultures, then what about creationism? I don't care where you go on it, but there has to be some kind of rationale for why you're doing it and why you're not. You're a museum. You can decide whether to do it or not and say, we're not going to do this because, and we are going to do this because. But the decision has to be made at some level, some top level. I wouldn't do creationism either, Matt, I totally agree with you. But I would allow Native American creation stories, and I can't even tell you why that's defensible, but I think that's a conversation you guys have to have. Where is the defensibility of your stance? You're allowed to do any stance, frankly, it's your museum. • Doris Ash

- As long as the visitor understands it so that when they walk in they know, here's what I'm looking at. • Julie I. Johnson

- Exactly. What reminds me of that is when The Field Museum decided to go cladistics instead of using the old taxonomy. That wasn't explained to the visitor. The visitor has to understand why there are these different philosophical takes on it. • Doris Ash

have those conversations about those few places. • Dan Rademacher

- But then we're just back to Steve's dichotomy of creationism and whether you have creationism and Darwin at the same time. • Peter Kahn

- I think you really have to identify what your mission is, which is science, and then let your visitors take the data, take the science, take the wonder of nature as it really exists in the world and draw their own conclusions and embrace them and make them part of their own belief systems. I really think that as science museums, our main goal is to speak about the natural world as it is. • Stephen Quinn

- I have a quick question relating to what Doris was saying. It might sound like we're underestimating our visitor. One of our goals is to foster a process of inquiry in the exhibits and the experience in the gallery, which happens to be a process that's shared in all of our disciplines: art, history and science. I just want to throw out the idea, what about the visitors figuring it out for themselves? • Amy Billstrom

- The thing about evolution is that half the people in the country—including many visitors to this museum—don't accept that it is supported by the evidence. The thing about relativism that is frightening is that every view is considered equally valid.

  This gets to climate change as well, if you're going to say that climate change is a problem. This museum isn't a newspaper. A lot of journalists feel you have to have a balance. Ninety-nine percent of scientists say one thing, but you've got to give equal time to that one percent. I think at some point the museum has to say no, we think climate change is the way this is happening and it is anthropogenically caused and we think evolution happened and the universe is 14 billion years old and things unfolded according to these rules.

  That doesn't mean we can't include other origin stories, but this is it folks, this is what we're saying. I think you need to be very clear to the audience about that because otherwise they're going to come in and say, see, you present this, but then you also present that, so how am I to make up my mind? I think you need to be extremely definitive about that. • Scott Sampson

- My creation story is only for my people and my particular place. We have a next door neighbor tribe that has a completely different creation story. Their creation story is valid too, and our creation story is valid to them, but they are two different stories. It doesn't pertain to people in New York or anywhere else, it's just a particular spot in Southern California. Our creation story is how we explain the natural world that we

live in, and its just the way we describe how it came to be. Actually, our creation stories are in songs and they're like 200 songs long, so they take a long time to sing the creation. • Richard Bugbee

- I'm speaking from the perspective of a historian rather than a scientist, but I actually don't think the two are that far apart. History is also based on evidence, and there's a difference between having a different approach to getting at truth, which I think a creation story can be or a poem can be, versus insisting that it is based on scientific evidence, which some creationists will do.

  For example, in history there are some people who deny the holocaust happened. I would never give equal weight to that because it is not based on any kind of evidence that is valid. But there are people who have very different perspectives on other kinds of historic events and what they mean to them. I might think about the fact that this group has this memory of this event, while this other group bases what they think about this on an oral tradition or other kinds of evidence.

  I think you need to kind of careful where you're drawing this line. Is it that you're saying the evidence isn't valid or are you saying there's a different mind set to getting a different kind of truth out of what you're looking at? • Louise Pubols

THE POWER OF PLACE

Native American Place Names and Name Stories

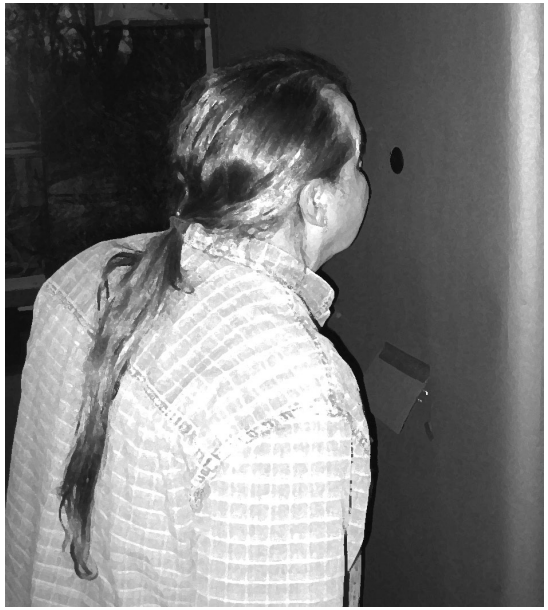
- Yesterday during the Place group's discussion, Richard Bugbee mentioned that as he drives through California he knows the different tribal group or language group territories and will say to himself, this is such-and-such territory as he passes through each region.

  What captured me even more is that he knows place names by the original stories. For example, this is the place where the oak trees scratched the coyote's back. That enchanted me. I'd love to see a map of California with the place name stories. I think every child had a place they named when they were growing up. All of the kids called the place I played in New Jersey "Golden Springs." We just named it. It was our wild place where we would go. My friend who grew up on Long Island said he and his friends named their place. I think kids would like to hear the stories of Native American place names. Then, as an interactive element, they can up with their own names for the places they know: the place where the stream used to be, the place where there are always oil puddles on the ground. • Catherine McEver

Myths and Stories of Anthropogenic Interference

- I prefer the word "myth" to "creation." I think when you talk about folklore and the myth of a culture, you start to see the linkages between all the different societal evolutions that took place. Maybe the thing to portray here is how there is a connectivity amongst the different indigenous California people and the people who came in and pillaged the place as well. Maybe there's a story that could be told, of anthropogenic interference if you will, through a myth that evolved into the present day experience. • Norman L. Miller

Richard Bugbee in the Natural Sciences Gallery



Refocusing on Visitor Stories of Place

- One meta-point that I'm honor bound to bring up is that we've gotten away from other people's stories, which I want us to remember because we're talking about community connections and we've gotten into the academic, museum people's conversation about how we design. I'm always cautious of that because it's what I call "painting the wheels purple" and discussing how we're going to do it.

  The point that I was making about Carolyn's story is that other people have stories. Not creation stories necessarily, but stories of place. If place is one of the main pieces that you want to include in here, places in California to be specific, other people's stories of place count, and you have to include it, and it has to be bigger than a post-it note and bigger than a Web page. I don't know what that looks like. • **Doris Ash**

Mary Jo Sutton and Dan Rademacher

Connecting Personal, Place-Based Stories with the Science

- It seems to me that the stories and science can both be covered at the same time. There's the importance of the stories and engaging the personal experience of the visitor and there's also the science. We've also talked about a sense of place and the idea that we identify with places. I imagine there are a bunch of ways it would be possible to say, "Tell us your story." Hopefully most of the time it will be in California because we're in California and nowhere near a border.

  I can tell a story of where I've lived or where something has happened. You then record that and let other visitors see that in some way. There are lots of technical ways to do that. But then connect that place with what is happening with the science. Here's your story, here's how you see the environment and that can be religious, it can be anything you want it to be, it's your story. It can be the oaks and the coyote, it can be anything you want. Then you have a picture of that place and say, by the way, here's the habitat with these species, and we have some information about those species here. This is the boundary of that habitat. This is what happens under an urban growth scenario, this is what happens under a climate change scenario, and you're connecting it all to your story.

  That could be map-based of course, or not, it doesn't matter. But we've now mixed two things which maybe we think of as independent, but maybe they don't have to be. It's the personal, emotional way of connecting to the science. • **Christopher Cogan**

Kids Relating to a Place Over 200 Years

- There is an Australian children's book (*My Place*, Nadia Wheatley and Donna Rawlins, Australia in Print, Inc., 1989) that covers one place in Australia over 200 years. It's a kid that says, "This is my place," and they draw a map and it has the same tree and waterway through 200 years. Every ten years it's a new person or the daughter or son talking about their place. • **Suzanne Pegas**

- There's a school in Oakland that's doing the same thing with the kids through all the grades using digital media. • **Amy Billstrom**

LINKS BETWEEN NATURE AND CULTURE

Portraying People's Relation to Nature

- We're going to have science in the gallery, but we're going to have culture in the gallery too. We had a woman here as part of our front-end evaluation last fall who said, "Oh, we used to eat plants like this in Ecuador when I was a kid." Along with the portrayal of nature in the gallery, we're going to have people's relationship to nature in the gallery. That's a cultural piece, so it isn't just going to be science in there. • **Mary Jo Sutton**

GETTING PEOPLE INTO NATURE

Museum as Trail Head or Train Station

- The sound of trains invaded my sleep last night and I actually dreamed about being in a train station, with all of these trains heading out in all kinds of different directions. I woke up and thought it was an interesting metaphor. It reminded me of something when I worked at the Utah Museum of Natural History. One of the things we came up with was the metaphor of a trail head, that the museum wasn't the place where everything happened and you walked away completely enlightened and that was the end of the game. Rather it was the starting point for your adventures out into the state of Utah and it helped you understand what you would then go and do.

  I wondered if the same could apply here, that this is a trail head or a train station or whatever. In some ways a train station is a better metaphor because there are people who, on their own, wouldn't go out and experience these natural places, unlike Utah where people do tend to get out to those places. It doesn't happen as much here, so maybe you can load them into trains, basically, and take them out to these places. They come here and learn about these places, but then they get on their metaphorical trains and go out and experience nature. • **Scott Sampson**

WHERE ARE THE HUMANS?

Humans Missing from the Dioramas

- One of my thoughts from looking around and trying to understand man's interaction with nature is that throughout these exhibits we really don't see natural man or man alone embedded in any fashion. I think that's missing from the whole diorama experience. Maybe that's something to think about. In other natural history museums that I've seen there would be different cultures being shown with animals and vegetation types and I don't see that here really. • **Norman L. Miller**

- That's one of the hugest fallacies out there, that that is somehow a primeval setting with no human impact just because it was essentially a 1492 scenario, that it wasn't already a cultural landscape because of the Native Americans in the area. • **Christopher Richard**

Humans Footprints

- Maybe you could just leave human footprints every once in a while. • **Richard Bugbee**

- Footprints would be good, and in fact there may be a way to portray a large carbon footprint now compared to twenty years ago or a hundred years ago. • **Norman L. Miller**

- I've looked at photographs of old Indians who

Unanticipated Audiences and Outcomes

- My dreams last night were atypically random, but in my shower this morning I was thinking about Wildflower Show collecting, which is the *Iron Chef* of museum design. You've got two and a half days, you've got whatever is blooming out there, and you're going to open a show. That urgency makes it feel like a competition. I used to feel like I was competing against Tony Faver, who was the best collector. She is now dead but I'm still out there competing against Tony Faver. Then I realized that it's really the people walking in the door who should be the judge.

  Then I was thinking about Van Cliburn and Tchaikovsky. Was he competing against other Russian pianists, which would be the first stage? Was he competing against Tchaikovsky's score? Or was he competing against Nikita Khrushchev? I realized he was competing against all of them, whether or not he was aware of it. In a football game, are you competing against the Pittsburgh Steelers, or is it Fox versus ESPN? It's all of these things.

  Getting back to the museum situation, I just realized we are doing all of these things. We're presuming that we can focus down to a clarity: Here is our point, here is our audience, we're going to sharpen it and then we're going to deliver it. But it's all of these unintended, unanticipated audiences who will walk in and be affected by it in ways we can't begin to predict at the point when we enter into the process. • **Christopher Richard**

What an Exhibit Can Do: An Introduction and an Invitation to Make a Personal Connection

• When we think about what we have to say about the science and we think about other people's stories, those stories from a visitor standpoint aren't intended to establish universal truths. They're just a way of a visitor making a connection with what you have to say. So I could say, "Look at this rock and the beetles that live underneath it and I'm going to tell you something interesting." I tell a cool little story and then I ask, "Have you ever turned over a rock and found a bug? Tell us about it." Wow. Now they can tell a story about finding a bug under a rock that does not displace what they've just been taught. Hopefully it builds on it or it takes it in a slightly different direction.

I always think of an exhibition as nothing more than a really good introduction. The worst thing that any exhibit can try to do is achieve comprehensiveness. By their very nature, exhibits are anti-comprehensive. It is a deliberate narrowing in selection. I think if we make those narrowing choices wisely and allow opportunities for people to make their own connections, we've stood by our ethics as a scientific institution and invited our visitor in. **• Matt Matcuk**

have never worn shoes and their feet are twice as wide. They're spread out. **• Richard Bugbee**

• I have a question for Norm. If we were to take this approach where visitors stories were contributed, do you think that would be enough of the man/woman presence for you or do you want to see physical evidence? **• Rebekah Berkov**

• I like the idea of the telltale reminder that there were footprints, and the fact that the footprint increased over time in ways that were not in synch with the natural environment but sort of counter to it, as if it has ownership now. There might be something that could be brought out by just showing footprints coming through and evolving and changing over time along with the timeline. **• Norman L. Miller**

• Maybe the footprints can tell a sort of meta-human story so that when visitors are telling their individual stories, we can start to think in our own minds about where their stories might fit in, and if any of the meta-stories resonate for them or not. And if not, why not. I like the idea of a footprint too. **• Carolyn Finney**

• It's easy to do. **• Norman L. Miller**

What Meta-stories Will the Museum Tell?

• What's a meta-story Carolyn? **• Matt Matcuk**

• I don't know, I just made it up. Isn't it good? **• Carolyn Finney**

• Do you mean another storyline or thread that is going to be carried throughout? **• Julie I. Johnson**

• I know there's not just one bigger story, but when we say "carbon footprint," that implies something, that implies a story, a larger story. Not a truth or untruth, a story, a way to understand, an interpretation of human presence on the landscape at a particular time. That's what I mean by it. What's that meta-story that the museum wants to tell? **• Carolyn Finney**

• The other one would be, like Richard said, everyone has a different creation story. That's another meta-story, that there are different stories about creation and they're all equally valid. **• Doris Ash**

• The fancy, post-modern rhetorical term for that is meta-narrative. **• Matt Matcuk**

VISITOR VOICES

A Caution About Cacophonous Overload

- As I'm listening to the conversation I'm getting the sense that there's obviously a tension around voices in an exhibition: How many, how big, how small? That's good that there's a tension because it means that you're really thinking about it. What I would caution you against is the following, and I'll use the art gallery installation as an example. They did some prototyping and asked visitors about it, and the visitors said you've got to get rid of these white walls. The artists are saying no, it has to be white.

  The visitors want color, and we could turn this into primary color land. What is it visitors actually want? Visitors want something to break up the white. Let's figure out how to do something that feels comfortable that honors the visitors' thinking about a space but is not so overboard that we turn it into something that is not comfortable. The staff used accents of color, which meets a little bit of both needs: the visitors' and the staffs'. The visitors' desires are somewhat represented in there by some accent.

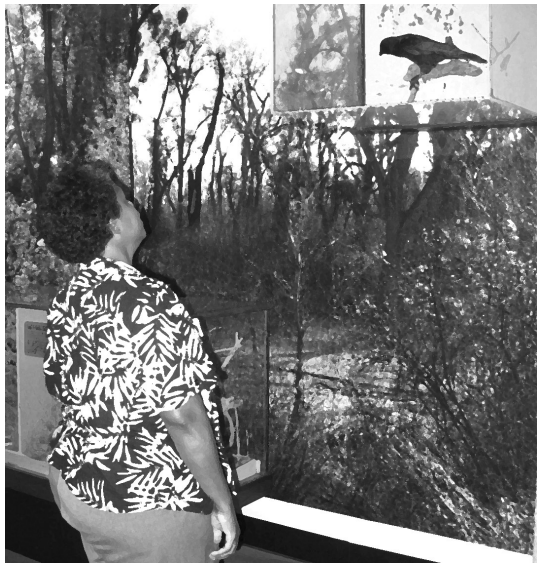
  Then there's the exhibition about California and there's some attempt to get the visitor in there, so there are going to be these mini-exhibitions. Thoughtful care is needed regarding where it makes sense and on what scale, especially if you've never done it before.

  What I would caution against is so many voices that actually none of them get heard and the story, or whatever, is muddy. There may be places where it is really appropriate and would add richness to the scientific story to have people's interpretations also represented so that I as the visitor can think, oh, I hadn't thought about it that way, but that's an interesting way to think about it. There may be places where it makes more sense to do that as part of the installation.

  It may also be that there are places where visitor voice emerges in the mediation. This gets you into a whole other realm: What is our staffing model going to be like and how does that experience happen? Then there may be places where the voice comes through in terms of additional programs. I'm just thinking that you may need to consider this larger landscape because in actuality, you do want some clarity as someone goes through. At least you want a clarity of particular messages that might provoke some thinking and get the visitor to ask different questions and consider different alternatives. But if it's noise, noise meaning too much, I don't know that you'll succeed. It's that cautionary piece of advice: Don't go overboard, otherwise you'll lose the effect.

  • **Julie I. Johnson**

Julie Johnson in the Natural Science Gallery



Carolyn Finney and Peter Kahn in the Natural Science Gallery

KEY MISSION AND MESSAGES

Positive and Hopeful: Focusing on the Beauty of California's Wild Places

- I was trying to think of what the mission of this exhibition would be. I actually did wake up in the middle of the night and grabbed a pad and started jotting things down. The first thing that came to mind is, California's wild places are beautiful, and I think that should be a major mission and goal of the exhibition. The next message that we would convey to visitors is, we know you want to preserve and save them, and here's how we all can help. You want to send that message as well. I think that sends a much more positive message than the doom-and-gloom of habitat destruction and climate change. You have to tell those stories, but overall there has to be this kind of fun, positive, hopeful message that we send. • **Stephen Quinn**

Keeping on Track with Major Themes

- I think the point being made here is that it's important to stick to a couple of main themes throughout without a lot of divergence from them but for these complementary stories or side stories that focus on the four major themes we discussed yesterday (place, community, climate change, visual representation). They could be interwoven without going off too far. Just keep it on track throughout. • **Norman L. Miller**

Twelve Preliminary Interventions

INTERVENTION 1: LAYSAN ALBATROSS & PLASTICS

Description:
Albatross fly thousands of miles foraging for food in the oceans to bring back to their nestlings. Many albatross are inadvertently consuming plastic trash, mistaking it for squid, jellyfish, or other food sources. Graphic photographs of the stomach contents of an albatross that died of starvation will be shown alongside an albatross specimen.

Goals:
- To help visitors visualize the impact of plastic trash on albatross (& other wildlife, by implication?), i.e.
- To present issue of ocean pollution in strong, graphic terms

Reenacting the Human-Nature Experience; Seeing and Noticing

- This was the intervention that I surprisingly liked the most, though it didn't fit that criteria of making you want to go outside. It involved just looking through a paper towel tube. I loved it. Part of what I loved about it goes back to when I was talking about the type of interactions that we need with nature that we're losing and those powerful ones when I was talking about wildness versus domestic.

I think one of the wild forms of interaction with nature is being recognized by a nonhuman other. It can happen at the domestic level with a dog: you see the dog and the dog sees you. We've all had it in the wild or in some version that is less domestic, whether it's a deer or a bear or a skunk or something. That's a powerful interaction. Birding can be that way.

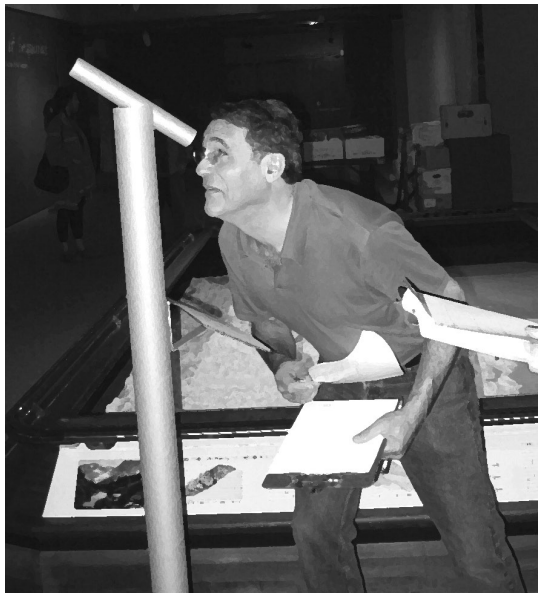
All of a sudden I'm looking up and I see the detail, and what is it I'm looking at? I'm looking at an eye looking at me. If you're going to create an experience, that's not me needing knowledge about something, it's me enacting the human-nature experience. It's quite powerful.

And look what you can notice, notice what you can notice. I don't do detail. It's a real problem with dioramas because I just don't see. What that exhibit helped me to realize, given my limitations, is, wow, it helped me

Ways of Looking at Dioramas: Preliminary Interventions

Twelve preliminary interventions offering a variety of ways of looking at dioramas were set up in prototype form by project staff. This activity involved diorama cases at various locations in the Natural Sciences Gallery. Advisors, guests and OMCA staff were equipped with review sheets and asked to visit and experience each of the interventions and record their responses to review sheet questions. This portion of the documentation covers comments regarding specific interventions, culled from both a plenary discussion and small group discussion.

Norman Miller eyes an albatross



What About the Plastic in His Stomach?

• So let me ask you something: What did you think about the plastic in the stomach? • Kathleen McLean

• Did I say the wrong thing? I didn't see that part. • Peter Kahn

• I could tell by the way you were talking that that part of the intervention wasn't part of your experience. Did anybody else miss the plastic? (A number of people raise their hands.) • Kathleen McLean

The Concrete Background

• We talked about the idea that it's disturbing to see the concrete behind the albatross. Just adding fabric behind the albatross would help. • Sidewalk Group Discussion

to see, and it didn't take technology. • Peter Kahn

A Readiness, Focusing, Observation Experience

• One of my questions was, did looking at the albatross connect in any way with this large topographical map sitting next to the scope? The label talked about the bird's range of flying and where it looks for food. I didn't even see the telescope first, so I was wondering what I was supposed to notice in this exhibit about an albatross and flying. Then I saw the tube and looked through it and saw an albatross against concrete. This was near the entrance, so I knew it was about focusing on something, but I didn't see the context. I wondered whether I was supposed to actually see evidence of the plastic, or was there something externally visible that I was supposed to notice in this particular assignment.

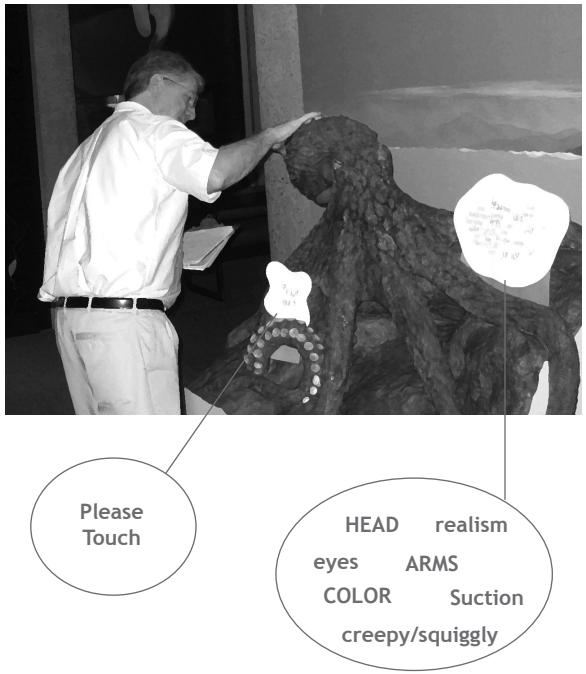
My second or third thought was, this could be interesting at the entrance to an exhibit about observation. Therefore, would the telescope move, and would a different label say something about: Can you find this? Can you find that? The focus would be about my skills of observation. The experience would be a readiness activity about focusing on things as you go through the exhibit. • Julie I. Johnson

INTERVENTION 2: OCTOPUS & WORD CLOUDS

Description:
Words used by visitors in front-end studies will be displayed in a graphic "word cloud" layout next to the diorama/gallery element that was being described. For example, words visitors associated with the octopus model will be displayed adjacent to it.

Goals:
• To assess whether peoples' words/thoughts about an animal or exhibit will enhance visitors' experiences of these displays

Stephen Quinn with octopus



INTERVENTION 3: BEACH POEMS

Scott Sampson at the beach

Description:

Audio recordings of the children reading poems inspired by their visit.

Not My Story

- It was a nice poem from an 11-year-old, but this was not my story and that took away from the display for me. Not that it's not a nice poem from an 11-year-old. • **Christopher Cogan**

Static Reification

- This felt like a static reification of a poem. • **Peter Kahn**

A Blah Black and White Image

- The image in the background of the beach diorama was black and white and I thought, the beach in black and white? The beach is really vibrant for me, as I'm sure it is for most people here, and I wasn't getting that vibrancy. • **Carolyn Finney**

INTERVENTION 4: SALT MARSH VIDEO

Description:

Video of a school group's visit to the salt marsh.

Connection, Detail, Urge to Go Outside

- I thought the video in the mudflats was an effective video piece because it was connecting well to the exhibit, it was helping me to see detail, and it was making me want to go out. There was a girl saying, "Don't bring clean shoes," and I thought, that's good advice. I've got to remember not to bring clean shoes. It gives me a way to move out versus the video with the forest fire. • **Peter Kahn**

Peter Kahn at the salt marsh

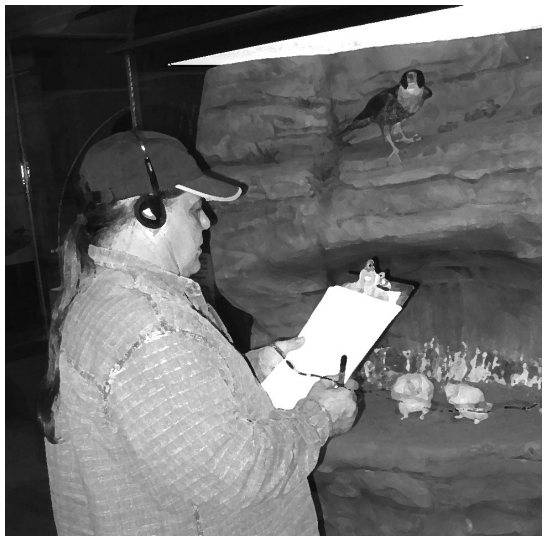
Interventions 3, 4 & 6: Place-inspired Poetry and Conversation

Description:

School groups and OMCA staff visited redwoods, the beach, and a local marsh, exploring the habitat and becoming acquainted with wildlife. Artifacts of these visits will be displayed next to the mudflat case, beach platform, and redwood platform.

Goals:

- To display artifacts of kids' visits to local places that are represented in the gallery
- To share the kids' responses and thoughts about these places
- To inquire whether these artifacts of someone else's visit has emotional resonance with gallery visitors, and adds to their experience of the exhibit



Richard Bugbee with Peregrine Falcon

INTERVENTION 5: PEREGRINE FALCONS

Description:
A memory of KW watching researchers camped out as they monitored re-introduced peregrines at Muir Beach will be spliced in with footage of researchers discussing this conservation project. This will be shown in front of the case containing a peregrine and nestlings.

Goals:
- To experiment with a storytelling method weaving together different perspectives
- To assess whether the sharing of other people's memories and projects might resonate with visitors and add information to existing cases
- To share information about a local species recovery effort

INTERVENTION 6: REDWOOD GROVE

Description:
A photograph and printed copy of a poem.

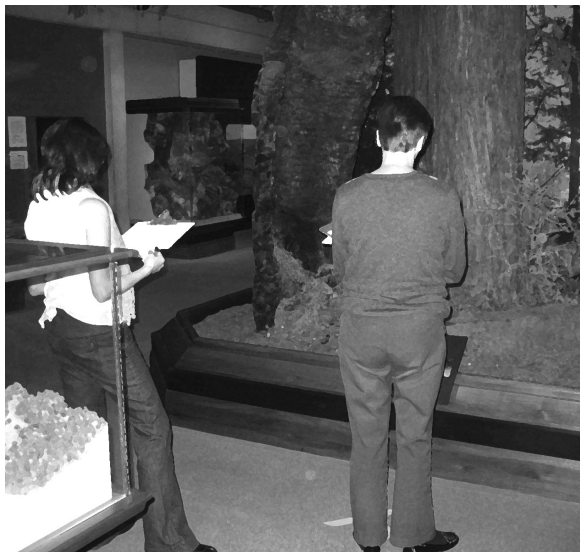
More Story Variety, More Immersion

- The redwood forest had a kid's story. I wanted to see the story with a 90-year-old woman sitting on the same log. It's an ancient forest, it's not limited to the experience of feeling pine needles under your toes. It took away from that experience for me. I wanted to see the bench in the forest, rather than the person on the log on the side of the forest. • **Christopher Cogan**

Stimulating the Urge to Go Outside

- I thought the poem with the redwood one was great. I thought the way the poem worked on the redwood one was different than the one in the beginning. The poem in the redwoods felt like, I want to go under a tree and I want to write a poem. It made me want to go outside. Or if you were going to create something, then you could create a redwood grove where you could go sit under a fake tree. Either I want to sit under a fake tree or I want to get outside and experience that. • **Peter Kahn**

Gazing at the redwood grove



INTERVENTION 7: FIRE SERIES

Description:
A set of three cases in the inner coastal range section depict a chaparral community in three successive stages: before a fire, right after a fire, and after new growth has occurred. An animation of the fire will be shown on a monitor in front of the cases.

Goals:
- To make more explicit the notion that these cases are representing a fire event
- To test whether a video animation helps clarify and add this kind of information

Jennifer Stock at chaparral fire

A Disconnect

- I thought there was a more typical disconnection here: here is the information and here are the exhibits. • **Peter Kahn**

A Temporality Case Study

- I want to say something regarding the temporality in the chaparral. I was standing there with someone else and we were asking, was this always this way? I didn't see the temporality before. You guys are talking about temporality, that change through time, and that chaparral is one of the places where you actually see it in motion. Even that simple little thing forces the temporal issue, and what is a carbon footprint, what is climate change? It's temporality. So you have a little mini case study in there: before, during and after. • **Doris Ash**

INTERVENTION 8: LIVING LEVELS PEEPHOLES

Description:
Moveable panels cover/reveal underground burrows.

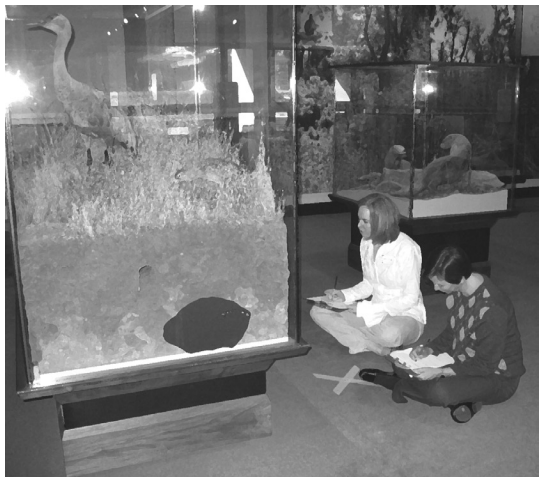
Step Two: Incentive, Reward, Information

- There's a step two that has to be done here. It's nice that I can be a kid and open the flap and see the salamander, but I need a reason to do that and I want to have a pellet when I do. I'm like a monkey in a lab pressing a lever, I want a reward. I don't mean that facetiously, like our visitors are stupid, like they're monkeys. We're all like scratching, grunting primates, right?

A Better Fire Video

Regarding the cases with the fire, just the signs themselves did a lot in terms of helping people to understand that those three cases are related, when a lot of people really miss that. Just the signs alone did it and we weren't really grooving on the video per se. There could have been a video that worked better for us. We liked the before, during and after but wanted a full cycle of the fire if we were going to get the video at all. • **Rock Group Discussion**

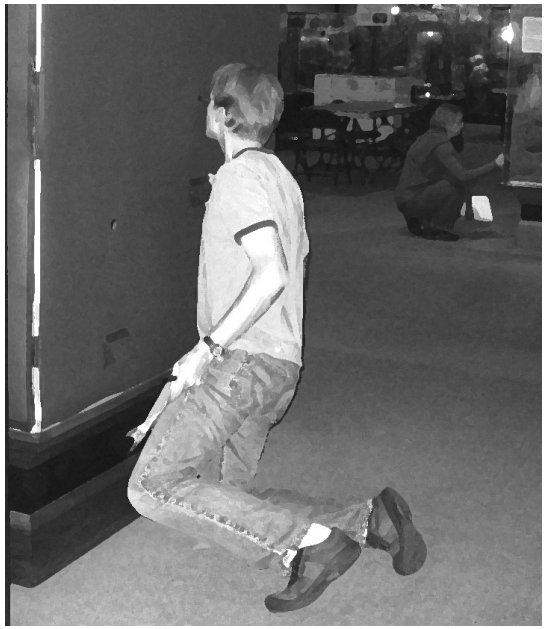
Louise Pubols and Lori Fogarty at peepholes



Interventions 8 & 9: Peephole Cases

Description:
By covering parts of two cases ("Tule marsh" and "Living levels") and allowing a small "peephole" view or series of views, we can experiment with different visual framings. This may encourage more focused viewing, and could engender a sense of surprise or discovery.

Goals:
- To assess whether framed views of animals, plants, or scenes can impact a viewer's experience in positive ways



Dan Rademacher at peephole

There could be a sign that says, "What kind of tiger lives underground?" Then I open the flap and it's a Tiger Salamander. "Why do you think it's called that?" I want to know what kind of tiger lives underground, that's sort of the next step. • **Matt Matcuk**

INTERVENTION 9: TULE MARSH PEEPHOLE

Description:
A black box covers the tule marsh case; peepholes allow a view inside.

Lighting

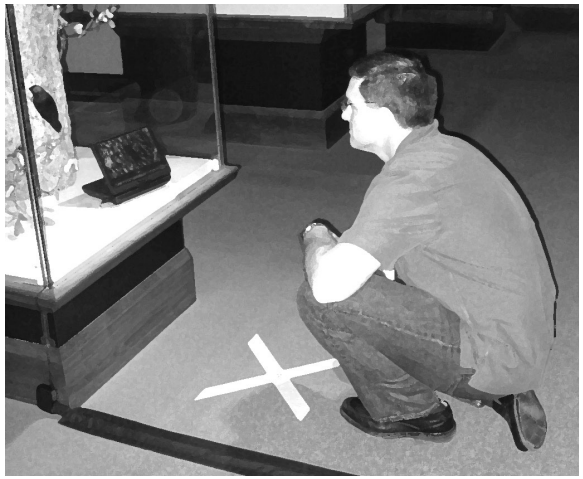
- I know we were only supposed to be looking at the interventions, but I had to be looking at the diorama too, and in some cases I was missing a kind of vibrancy. The one where it's covered with black paper and you peek in, I wonder if you could do something with the lighting or something because that looked different from the other ones where it was kind of open for us to see. Overall there was the sense it was different because it was covered in black and when I realized you had to look in it was really cool. • **Carolyn Finney**

INTERVENTION 10: WOODPECKER PAN

Description:
A video of an existing case will be modified to inject movement and sound into the scene. This video will be shown alongside the case, in what could be an interesting juxtaposition. A view of birds in a tree will pan slowly for visitors and when the camera reaches the acorn woodpecker, this bird will "come alive" through the use of live footage and a recording of its distinctive call.

Goals:
- To surprise visitors with the juxtaposition of real-time animal behavior and the taxidermied specimen
- To assess whether this kind of intervention adds to or distracts from the real specimens in the case
- To work audio into the visitor experience in a memorable way

Scott Sampson eyeing woodpecker



About the Woodpecker Video

- With the woodpecker intervention there was lots of debate. It would have worked better if the static picture had ended quicker and moved to the real thing. There was a little too much delay. Or maybe we wanted more videos or more footage; we wanted to see more exciting behavior of things like mating or how they put the acorns into the oak tree. • From Rock Group Discussion

- Echoing what the Rock Group said, we had a range of perceptions about the woodpecker. Some of us really liked the idea that this static thing comes to life. Others thought that it totally took away from the actual physical creatures. It was also kind of simplistic and didn't add much to the story. It competed with the label which was on the other side of the case. • From Sidewalk Group Discussion

Louise Pubols and Julie Johnson with foxes

INTERVENTION 11: FOX & PIKA: WHAT HAPPENS NEXT?

Description:
In a winter scene, two foxes are suspended in time, chasing down a pika. Will they catch it? Will it get away? Using a set of illustrated cards, visitors can organized them into time-lapse sequences, helping them to imagine possible narratives based on the event depicted in the case.

Goals:
- To experiment with a low-tech format of time sequencing in relation to events shown in the dioramas
- To assess visitors' sense of story and timelines in the dioramas
- To highlight a few possible predator/prey narratives

Relation to Pika Case

- With the pika, there was a sense of the relationship just being one way and that little creature was just there to be food, and yet a lot of people didn't get (and why would they) that there was a relationship to a case right next door that had the pika story. How could we create a relationship between those two cases? One idea was to create a false topography, a feeling that you are underground and looking in on something, or even just arrows on the floor, something that would connect those two cases to each other and make the story fuller and not just depict the little guy as food. • From Rock Group Discussion

Tracks, Stand-Alone Elements

- I especially liked the fox story where the visitor can rearrange the sequence of story-line cards. As I looked at the animal tracks in the sand I thought about "the story" being suggested by this display. The drama each observer imagines will vary, and the idea of multiple card sequences encourages the visitor to ponder multiple scenarios. In addition to the animal tracks within the case, I wanted to see a series of human footprints to and from the display case. The tracks were telling the story and the visitor could be made a part of the story with their own foot prints. This could even be done electronically with pressure-sensitive panels and glowing footprints in floor around the exhibit! I also liked the way this exhibit could engage the visitor across a hierarchy of levels. The tracks in the case worked all by themselves even without showing any animals. Placing the animals in the case without the tracks also works. Adding the cards and visitor footprints supplies even more elements, yet they all work independently. For this exhibit (and many others), a hierarchy of information levels will allow a broader range of visitor experience, and provide returning visitors with opportunities for deeper thought. • Christopher Cogan

Rattler: Surprise and Footprints

• I wanted to be taken by surprise, and part of the challenge for me was that I already had an expectation about what I was going to look at. One big surprise was that snake at the end, and I liked that. I walked up to the case and there was nothing, and then there was the rattle and I literally jumped. I actually really liked that.

And I would like to say that I love the idea of the human footprints because I wanted to know how we were interrelating. So give me something in that rattlesnake case or the others, even if it's just footprints denoting "stand here." I could have almost walked by it. The only reason I didn't was because there was an X on the floor and I knew I was supposed to stand there, but I could see somebody thinking, I don't see anything, and moving on. You have to stand there for a few seconds before that sound comes on.

• **Carolyn Finney**

Fox and Pika: Other People

• I came upon this exhibit when someone else was using it. The cool thing was to see how Lisa's story was unfolding. And then because I'm not an inquisitive seven-year-old, I felt compelled to take one of her cards and say, "Well no, here's where I would put that card."

She then said, "Well here's the kind of story I'm talking about," and I thought, oh that's interesting, the story could be told this way. We were having an interaction with the cards as well as with each other about our different stories. Then she said, "Someone else had another story that was totally different from mine, but I didn't like that story so this is the one I've created." I thought that was a really powerful thing.

One suggestion is that you might want to put the cards on two sides so you could have two sets of interactions happening. It was such a nicely done, low-tech intervention. Still, you don't want to overdo it. • **Julie I. Johnson**

INTERVENTION 12: RATTLER IN THE DARK

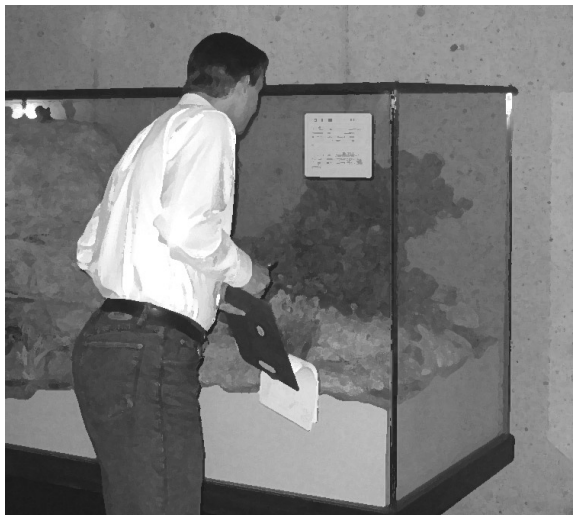
Description:
The rattle of a rattlesnake hiding under a rock formation will be triggered by a motion detector as visitors approach.

Goals:
- To surprise visitors with the juxtaposition of real-time animal behavior and the taxidermied specimen
- To assess whether this kind of intervention adds to or distracts from the real specimens in the case
- To work audio into the visitor experience in a memorable way

Rattlesnake Baskets

• We talked about indigenous rattlesnake baskets connected to the rattlesnake intervention. • **Rock Group Discussion**

Matt Matcuk braving rattler



Intervention Discussion: First Pass

THE INTERVENTIONS IN GENERAL

Variety

- Overall I liked the variety of things that you were trying. While there were several instances in which I thought the interventions weren't right for that particular case, I appreciate the effort to try the different types of interventions. I did the series backwards, so I had a different experience. I met another individual coming from the opposite direction halfway through and they said, "I see a pattern emerging." I didn't see a pattern, maybe because I did it backwards.
  • **Julie I. Johnson**

Not My Story

- I think I was the one who said I saw a pattern, and right after that the pattern dissolved. I started in the correct order. I really liked the way that in some cases it added to the story. In some cases I thought that worked well. Where it didn't work for me was when the story was not my story.
  • **Christopher Cogan**

Go the Next Step

- First of all, I liked a lot of what you guys were doing in there. I think almost every idea was a strong step in the right direction. I wrote tons and tons of criticism and I would not have done that had they not been so good. In almost every instance, though, I looked at it and said, okay, they've taken that step here but there's a step two that has to be done here. For example, the salamanders underground (see Intervention 8 comments). In almost every instance I was looking for that involvement, for the next step. • **Matt Matcuk**

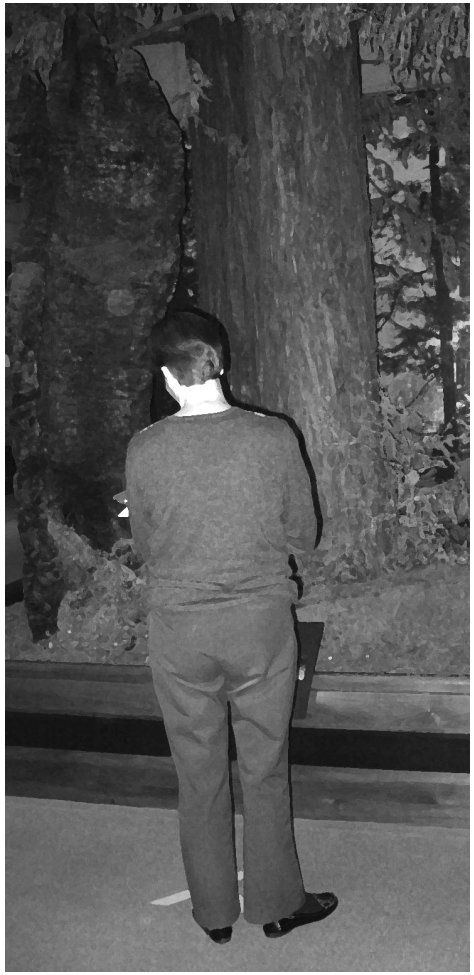
- So you're actually saying go further.
  • **Kathleen McLean**

- Yes, and don't go further by trying to add content, go further by using what you've done to get them to be involved more. If I look through a peephole, that's cool, but give me a reason first. Like above that little peephole, ask, "Who carries his house with him everywhere he goes?" The visitor can respond, oh I know this one, it's a turtle! Then the flapper down below gives me something that I don't know, and something more important than a funny sounding Latin name. Give me something I don't know. Like, "Hey, guess what? They're not really like houses, they're more like tents," or whatever. • **Matt Matcuk**

Lori Fogarty with redwoods

Ways of Looking at Dioramas: Preliminary Interventions

This portion of the documentation covers comments about the interventions in a plenary group discussion.



Criterion: Does It Make You Want to Go Outside?

- I was surprised I liked them as much as I did. This totally turned me around, so I was trying to unpack what I was liking about it. I'm not sure I agree with Matt about needing more with a lot of these things. I was talking to Scott and the one take-home message I get from Scott from this meeting in terms of effectiveness of the exhibits is that I kept wanting to go outside. I know it's not the only criterion, but I think it's a powerful one, and one that I share. When I was going through the exhibits I was aware of which ones were leading me in that way and how the technology was working effectively in that way. • **Peter Kahn**

Dan Rademacher and Doris Ash

Providing the Feel of an Outdoor Experience

- I really value the exercise and the activity and having a chance to interact and take in the exhibits and make comments. I was surprised by two exhibits that made me actually feel like I was outside. It was a sense that I didn't expect to have in this museum, especially in light of some of the discussions we had yesterday about how you bring that out, particularly in groups of youth that we're trying to attract. How do you make them want to take the experience and then go outside?

  The two places I had that feeling were the shoreline area with the children's voices and their perceptions. Usually I'm not usually a fan of a listening station, where you hear about someone else's experience there, but I think it did work to draw out what this place can be like if you are outside. Also the sequoia grove area. There's something about displays that are out of the box or case. In that one the vegetation hung over your head. I wanted to highlight those two especially in terms of drawing you out of the box or the case. • **Lisa D. White**

Humanizing, Enriching, Hybrid Experiences

- Something that I saw that I really liked was a genuine humanizing of the exhibits, the culturalism, the bilingualism. I don't want to use the word sterile to describe some of the pieces because they're not, they're very rich, but they're very science oriented, "museumy" dioramas. I agree that they didn't all work equally.

  The other notion is getting away from that minimalistic signage. They're hard to see, they're difficult to understand, they're very scientific. So all of a sudden that enriching makes it much more complex. I think the things you did, by and large, made the experience more complex and certainly slowed it down. On the timeline task it really helped, especially in terms of bilingualism, to listen to that and to listen to the story of Brian Walton, which was a little scientific but also very interesting.

  The other thing is that I've seen you moving toward the notion of hybridity, that things can do more than one thing at once and it can be really rich. So there's a little play, a little show-and-tell, other voices, and that kind of stuff enriches the experience. • **Doris Ash**

Children's Voices

- One of the things I really liked was that you had the children's perspective. For me it's the idea of empathy. My first impression is asking me how I feel. I like the one where the girls were talking because it forced me to be more childlike and remember that curiosity. It also made me become more concerned for their experience and whether

they'll still have this experience in the future. So I really liked the children's pieces, which might just say something about my personality. • Carolyn Finney

Making Dioramas Exciting and the Effectiveness of Immersion

- First of all I want to echo Matt's comment. I was impressed by all of the activities and I was more impressed than I expected to be. I'm not a huge fan of static dioramas and I still struggle with that as a concept. It made me think that you really could pull it off and make it exciting and different and feel new. I wanted to make that general comment because it made me feel much better about the whole thing.

  To me the ones that worked all did a better job of immersing you into the diorama better in the sense of trying to reconstruct reality and being there when you're not there. It's really third or fourth fiddle to actually being out in nature, but if you can look through a little peephole and feel like you're immersed in that setting, anything that narrowed your attention and focused you did a better job. One of the problems that I found was with the tidal flat and the fact that you can walk all around it, so it doesn't feel immersive at all. I want to take that whole exhibit and stick it into a corner with black all around it or put a painting around it and turn it into a true diorama, just so I feel like I'm there more. That kind of thing didn't work for me. But there were ones that really did, like the rattlesnake. You're immersed. All of a sudden you're there. You actually have that little reaction. And being able to look through a hole and focus on something, or something that narrows your attention. Just as a general rule, anything you can do to make those experiences more immersive is probably going to be better (as well as trying to get people to go outside and experience it first hand). • Scott Sampson

THE GALLERY IN GENERAL

The Overall Floor Plan/Story Line

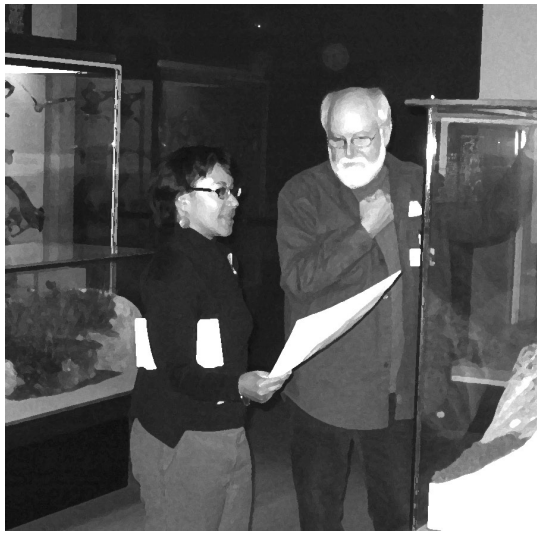
- I really liked all of the interventions. They were very creative. My only thought in going through the gallery was that I wondered if it was almost like putting the cart before the horse. In other words, do we want to consider, or have you already, an overall floor plan of the gallery space with a sequential story line through it, and how these individual exhibits would work within that larger scene that you're trying to tell? It seems to me that you've really developed some creative ways to use what you have, but you still now have to fit them into a larger story and make it work. • Stephen Quinn

- The intention of this project is to work simultaneously from the top-down on big concepts and from the bottom-up on specific experiences. We want you to step outside the big meta-story that the gallery is going to pres-

Encouraging/Enabling Interactions with Other People

- One thing that I was trying to think about was whether the interventions encouraged or allowed for interactions with other people. This relates to some of the work I did on the PISEC project about making exhibitions more supportive of conversations for family groups. I was thinking about this as I walked through the gallery. (See Johnson's comments under Intervention 11 for a good example.) • Julie I. Johnson

Lisa White and Christopher Richard



Deeper Questions About the Interventions

Generated in plenary discussion and addressed in breakout groups:

- Which focused your attention on the dioramas and which detracted from the dioramas?
- How many interventions: per case, per area?
- Does the intervention change how you see something? Your level of interest? Do different ways of looking/observing affect you differently?
- What are the different types of engagement or immersive experience that have been employed, from observing to physical position, to fear.
- Are the interventions making it harder to see cross-species and cross-gallery connections? Are there interventions that could highlight those connections?
- Are there interventions for the space itself, for the spaces between the cases?
- Which interactions tap the emotional/spiritual side of visitors, stimulating them to make that connection with nature?
- Is there a place for humor and even irreverence? What are the issues regarding levity?

ent and focus on these specific interventions. What about them? What are your specific thoughts about them? • Kathleen McLean

- I think the idea of the meta-narrative is good 20th century thinking. It's really good if we have a ton of exhibitions like that. I myself am starting to say, the story is right here. There's a story in this case and this story is big enough that my kids will have a great time with narratives around that. • Matt Matcuk

- We will want to work on meta-narratives at the same time, but this exercise is really about the individual interventions. • Kathleen McLean

QUESTIONS STAFF (& ADVISORS) WANT ANSWERED ABOUT THE INTERVENTIONS

Which Were an Asset to Dioramas?

- Which elements made you want to investigate the dioramas more and which do you think actually took away from the dioramas? • Douglas Long

- That's a good question. With a lot of them, I looked at the interventions and hardly looked at the dioramas. Things were so cool I didn't pay attention to the dioramas. • Kathleen McLean

How Many Interventions?

- I have a question about the number of interventions. Is there one per case, one per area? I heard what Scott was saying about being able to get into more spaces, but there has to be a saturation point on that. Does every case need an intervention? • Suzanne Pegas

The Effect of Different Ways of Looking

- I was interested in how you distinguish between which kinds of wants make you look more closely and look differently than the others. Looking through the peephole flap, how does that feel in your body, how does that affect how you see it versus looking at the albatross one? Are those different experiences? Does one make you more interested in what you're seeing? Does one make you less interested. Not just those two, but overall in the gallery. • Mary Jo Sutton

Different Ways of Engaging and Being Immersed

- I wonder if you're raising the issue of different ways to interact. When you were down on your knees and opening something up, this was a huge, beautiful experience of nature. You get off your feet and get body connected. That's one form of engaging versus the looking and narrowing. I guess what I'm trying to do is complicate it a little bit and flush out what it means to be immersed. It's all of these different forms of interactions. And

fear is an amazing thing. What the rattler is doing is tapping not just a type of immersion but a type of immersion that has to be characterized. That's fear, and that's what we experienced when we heard the rattler.
• Peter Kahn

Connections
Cross-Species and Cross-Gallery

- I'm going to indulge myself briefly, being an old geezer curator guy at heart. The primary deficit that we in the department have seen going into this whole process was a weakness of the ties between the community clusters of cases. My strong reaction to all of these interventions out here is that they have taken the story not only away from the interactions that spread between cases, but even the interactions within the cases, and focused them every more strongly on individual animals, also to the exclusion of plants. I want to know how similar devices can begin to broaden the perspective to a more integrated view of the components in the gallery rather than just a field guide to birds.
• Christopher Richard

Tapping the Spiritual/Emotional

- My question is, which interventions bring you as visitors into the emotional/spiritual realm? This follows on Peter's question a little bit, acknowledging that part of the visitor that is separate from the intellectual self that could actually bring that visitor out into nature.
• Rebekah Berkov

Humor and Irreverence

- I wonder a little bit about humor. I want more humor in the gallery. Some of these were trying to be a bit playful I think, and I don't know if that comes out, like jumping at the rattler. I'm wondering what you guys think about humor and levity and maybe even moments of irreverence and how that might be added in and what the issues are related to that. • Karina White

Reorganizing the Space

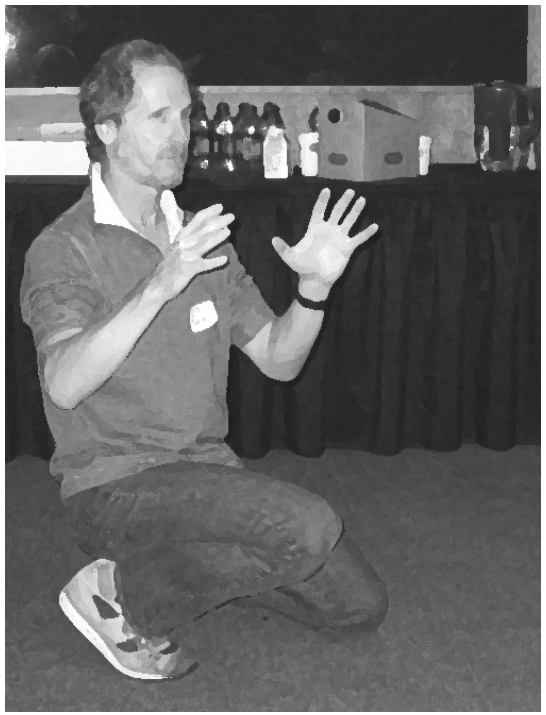
- Some of these questions make me think back to Stephen's earlier question about the larger area. More specifically, is it possible for the space to be rearranged? If it is, then the answers to some of those questions are different than if you say no, they've got to stay where they are. • Julie I. Johnson

- The space will be reorganized, with some elements being taken out and others put in. They were left there so you would have access to them during this session. • Kathleen McLean

Interventions
to the Spaces Between Cases

- I wonder about what Christopher was saying, if there are interventions that aren't to the cases themselves but to the greater space. The space outside the cases might do something to get at that integration. So what about interventions to the spaces between cases?
• Suzanne Pegas

Peter Kahn demonstrating ways of physically engaging



Intervention Discussion: Second Pass

Ways of Looking at Dioramas: Preliminary Interventions

Participants divided into two groups and focused on the questions outlined on page 90. This portion of the documentation covers comments and report-outs during a second-stage discussion regarding the dioramas. Comments about specific interventions have been included in the section of this document titled "Twelve Preliminary Interventions."

Advisors/Guests Participating in Rock Group

- Peter Kahn
- Christopher Cogan
- Richard Bugbee
- Doris Ash
- Carolyn Finney
- Jennifer Stock
- Scott Sampson

ROCK GROUP SUMMARY REPORT

Suzanne Pegas Reporting

Amount/Degree of Interventions

We said yes, have lots of interventions, but not all interventions. Somehow we weren't paying attention to the cases if they were all interventions. Some felt the interventions should be optional, others liked the forced interventions. Some said they didn't want to be forced and others said they thought it was great that they got to make the choice in terms of the fully closed out case where you have to peek in or not.

Quality of Interventions: Recreating Nature, Using Multiple Senses

There was a discussion about quality of interaction that we want to see. What are the most powerful stories in nature and how can I recreate those? Can I construct an experience that gives you a part of that? As Peter was sitting up on this warm rock, I was wondering, can we heat up a rock in the gallery that you could be sitting on because that is a powerful experience. There was the idea of bending down and peeking in, using multiple senses. One experience that can be created is the sense of fear,

Peter Kahn sitting on warm rock

like the intervention with the rattlesnake. That forces more of an interaction or a relationship between the visitor and the case.

Simultaneous Interactions

There was also the sense of wanting simultaneous interactions so I don't have to wait in line for my turn to have the interaction.

Interaction Among Visitors

A question for the museum is, do we want to be encouraging interaction among our visitors? We have to make some kind of decision around that. Do we want people who didn't arrive here together to talk to each other about the cases? We know that families will be doing that. Do we want to foster that between others. The example used was the pika and the fox intervention, which could potentially cause interaction between people who didn't know each other in advance.

Bridges to the Deeper Ecological Story

Are the interventions bridging the case to a human story, to my story, or to the ecological story? There was a lot of discussion about that and that the interventions we saw thus far were bridging to a human story that maybe wasn't mine or maybe I could connect with, but not to deeper ecological stories for the most part. There was definitely a desire for interventions that would connect us to the ecological story, and that was lacking.

Subtler Use of Video

There was a question about the video devices and whether it would be possible to build onto those with leaves or branches so that you see only the screen but not the device.

Options, Choices, Ways of Connecting

Could there be some options at each intervention place? For example, can I interact with the kid in me, the place, an elder's story, a Hollywood version, whatever? Can I have some choice of the interaction so I can connect with what works for me? Are there more tactile opportunities so in places where I know I can't touch the diorama, I can put my hand in a box and feel something? There could even be five or six things to feel and the challenge is, what in the case am I feeling? I put my hand in the box, feel something, and think oh, I bet it's that creature.

Respect for Nature

We talked about respect and the idea that that is something we could be conveying. What is your relationship with nature? One of respect is one. You could go back in time to show how people respected nature, show that it is something that many cultures still hold, and highlight the idea that it is something we are fostering. This helps build a lot of different things. Where does respect come from? It comes from awareness, consciousness, interaction.

Effective Use of Wall Graphics

- We also talked about the picture on the wall behind the fire cases (a black and white picture of the chaparral). That particular picture didn't work for me, but a wall graphic is a very simple way to connect pieces. Why didn't the graphic behind the fire cases work for me? The cases were gorgeous, the before, during, and after the fire. Then you turn around and look at that black and white photo and it's a distant view of the landscape. It took a moment to stop and think, oh, okay, that's also the same kind of vegetation. If it had been nearly the same scale, it could have been like a diorama that you were inside of. That was one reason it didn't' work. But it did work because of its immensity and its size. It went all the way to the ceiling and I did like that part. There are probably some neat things that could be played with there that are relatively inexpensive and technologically simple. • **Christopher Cogan**

Trying to Get More Real

- Regarding the discussion about trying to get more real (recreating nature), I think most of us agreed that yes, we will never get there, but that doesn't mean you don't try to do it a little bit better. • **Christopher Cogan**

Body Postures, Breaking Set, Stimulating Interaction

• I would just add that there was a little bit of a discussion about body postures and how people act in public spaces and mixing that up, getting people to bend down and to be on their knees and how that stimulates interactions between people. It's trying to create social interactions around a topic, around an environment, around a habitat, around a species. • **Rebekah Berkov**

Use of Media

• We spent a lot of time talking about the use of media and whether it helps or hinders the experience. We didn't have an answer. • **Mary Jo Sutton**

Differing Visitor Needs

• There was one more thing I wanted to add, which was Doris's comment that a mixture is good and a diversity of experiences is good. We spent a long time talking about 2-D versus 3-D and immersion versus less immersive environments. Doris's comment really spoke to me because we all have very different perspectives and experiences and in some areas we overlapped and in some areas we didn't. It presented the idea that visitors are all different and to keep that in mind. • **Rebekah Berkov**

Enriching the 3-D Space

We got into a big discussion about 2-D space and 3-D space. We have 3-D space in our cases. How are we using those to our advantage? There was a sense that they're a semi-impoverished 3-D space in terms of interaction and yet they are 3-D space and 3-D space is great. So how do we enliven those more? There was the idea of lighting that changes. We have a lot of ceiling space that we could be working with, so we could have up to three feet of elevation change in different spaces. We could be looking underground, we could have more stuff in the ceilings. There was discussion of the more enclosed, classic background of the diorama. There was the idea of being able to climb up to see something. Different textures underfoot. What are my feet telling me?

Do We Want to Recreate Nature?

We got back into the question, can we really recreate nature? We know that we can't, so should we really be trying to recreate something that we know we're never going to actually be able to do? Is it worth it? Is that the area where we really want to go?

Use of Sound; Noise Pollution

Then we got into a last bit about noise pollution and the technology around cones and the fact that we like the sound but we don't like the noise pollution.

Rock Group

SIDEWALK GROUP SUMMARY REPORT

Karina White Reporting

Naming, Labels, Information

We started with a bit of discussion about the names on those little windows (Intervention 8: Living Levels Peepholes) and the fact that that was the only information we were offering on those labels. And yet there were these other labels that were sort of tacked on the cases and looked like they had potentially been added for this intervention. They had actually been used for an earlier round of interpretation, but the discussion about those labels versus just the naming brought up the question, what is the most important information to communicate here and what about naming? I think there are some really rich questions there. Do you give the Latin name to people? What other things do we want to be sharing or thinking about?

Contracting Experience & the Focus on Vertebrates

There was the idea of expanding your experience with these cases versus contracting, which is maybe about scale of these interventions to some degree. Christopher pointed out that most all of these were focused on vertebrates, and we all know that in the natural history world it is often skewed towards the big mammals. Here, these involved smaller mammals and birds, but they were nevertheless vertebrates. When you ask people to look at one thing, does that shift mean that they're not paying attention to other things?

Using Labels as Graphic Pathways Through the Exhibition

We talked a bit about different kinds of experiences and how we might use different kinds of labeling to facilitate and/or encourage different kinds of visitor experiences through the gallery. For example, a label might take the form of a clipboard to address scientific process information. Other labels might be little flitty, fly-by pieces of information. There could be these different kinds of narrative pathways through the exhibition that could be indicated graphically or otherwise.

Advisors/Guests Participating in Sidewalk Group

- **Julie I. Johnson**
- **Stephen Quinn**
- **Matt Matcuk**
- **Lisa D. White**

Sidewalk Group

About Expectations of Video

• People don't just expect a more polished version when they look at prototypes, they expect a polished video in the final version. • Kathleen McLean

• That's true. Can you really be casual with video? • Karina White

• Or do you have to strive for high production values everywhere? • Kathleen McLean

Inhibiting Free Choice

A counterpoint to structuring potential narratives through the gallery is the question of whether that's actually possible or feasible for us to be doing. Can you actually do that for visitors and does that potentially inhibit the free choice procedure of visitors.

Grouping and Interstitial Space

The space between the cases is a really big issue and something we are only beginning to really talk about. The interventions were about moments with the intervention and didn't try to tackle that interstitial space. We had a similar conversation about the fire sequence and the fact that just those three labels helped people notice that those are a group. Steve said that made him notice that there are other groups in the gallery that he hadn't noticed at all before. Certainly that's an area that we need to work with.

The Meta-Narrative

We got into the meta-narrative debate, which is kind of the big idea debate. Can you do big ideas in exhibits? Can they be successful? We had differing views about that. Successful examples include the Creation Museum in Kentucky, where they successfully communicate their meta-narrative.

Use of Video in Cases

Regarding the use of video in a case, could visitors control or interact with it? Can they zoom in themselves and participate in that? I think this addresses the big question that we're all grappling with, which is the introduction of technology and media. What is the relationship? If we're going to do that we need to be really thoughtful about the video. What is it doing? Is it adding to the experience?

The nature of prototyping was another interesting topic. We may have higher expectations of video as a polished thing. We can stick text or graphics up by a case and people accept that, but people have higher expectations of a video and expect more polish.

Intellectual Pathways

Ultimately we do feel that we need intellectual pathways through the exhibition. This could be through the places or it could be something else altogether. It could be behavior based, how different creatures store food. You have woodpeckers and fish and different ways that you could slice paths. The hotspots could be another one of these ways we link things together.

Lack of Definition, Punctuation

We talked quite a bit about immersion and design issues, and about how to announce to people what section they're in, using color and different things to set places apart. The whole group feels that the gallery doesn't have enough punctuation. There may be too much openness, and it's hard to really understand what you're moving through. That connects to

the interstitial space and how these places are linked together.

Multiple Voices

We also talked about multiple voices. Within even one intervention, maybe we could do kids and adults, mixing those up.

Wall Dioramas versus Cases

We talked about the wall dioramas versus the case dioramas and how some people were picking up a bit of a disconnect between the experiences with those. Some people really connected with the dioramas within the walls and others hardly noticed them.

Lighting, Placement, Integration

There was also the idea that maybe the way some of the individual cases are lit and set apart may be at odds with the experience. There was also the feeling that it's not very well integrated.

Space to Reflect

With the sense of place, there was the idea that maybe we don't need to hit people over the head with the sense of place. This tied into the interstitial space also. You suggest space or places but allow people their own amount of space. That has to do, I think, with the visual clutter that may currently exist. It's a little hard to focus sometimes on these things because there's so much going on around them. Part of our challenge is to create spaces for that kind of reflection. That connects to our final point.

Redwoods as a Place to Reflect, and as a Start or End Point for the Gallery

The redwoods kept coming up as something that seems really powerful for a lot of people and the closest thing that's working right now as a place. That could maybe be the "Aha" moment, arriving at that. And we could place benches within it and create a space where you could sit and be thoughtful. You could have reflections from people of different ages, but it could be a place that impresses you in a certain way but also allows you to reflect and share your own impressions.

I think one interesting idea is that the experience with the redwoods might be at the start of the gallery, and you might end up with a more urban experience at the very end of the gallery versus starting urban and ending with the redwoods. Those two are really interesting ideas.

Urban "Aha" Settings

Hopefully it's not just the redwoods that are the "Aha," but maybe there are urban setting we can create that are also "Aha." Just "wow" moments that are not so polarized and not so linear.

More Discussion Needed About Place

- Looking at my notes, there's still a lot to be talked about with the discussion of place and how we're going to deal with the whole issue of what various people are saying about the experiences people of our generation and walk of life may have had with the wild. Exactly how are we going to wrestle with that urban, suburban, wild, controlled parks, whatever. There's still a lot that needs to be explored around that. • Amy Billstrom

Suburban

- One thing that we haven't talked about at all here is the role of suburban and housing tracts. We tend to oversimplify with urban and nature. Once we take a closer look at what future conservation issues are, we just might be looking at a different type of interpretation. • Amy Billstrom

A North-South Flow

• That unfolding that Julie is talking about could be accomplished using a geographic, north to south progression. In far northern California there are fewer people, but as we transition to the southern portions of the state there are increasing examples of urbanization and loss of habitat issues. From the redwoods, to Oakland, to Los Angeles, and San Diego there are many opportunities to tell the stories of the human-nature interface. Museum visitors will have different perspectives and varying levels of engagement with nature, but a geographic progression could help to provide a framework for the exhibits. • **Christopher Cogan**

Sidewalk Group

ADDITIONAL COMMENTS

The Urban-Nature Interface

• There's the urban-nature interface which ties to the hotspot concept, which we really haven't talked about at all. That would be a huge story that could be interlaced with all of this that we haven't even touched on. We'd need two more days. • **Christopher Cogan**

Emotional Unfolding to a Big End Payoff

• Regarding how you start, how you end and the "aha" moment, I think an important thing has to do with revealing and how the experience unfolds through one's visit. What I mentioned was, first, whatever you deem is your big payoff, you shouldn't be able to see it from the beginning. And second, when you turn that last corner and come into that last space, it should really be your big payoff. Your emotional experience is repeatedly ratcheted up as opposed to peaking in the middle, which happens now for me in the redwood forest. I think it's cool, and then it emotionally goes down again. Think about the flow of the experience. • **Julie I. Johnson**

Parting Thoughts, Cautionary Tales

WORST CASE SCENARIO

A Bunch of Old Dioramas

- My biggest fear is that you open up this exhibit in a few years and people say, "It's just a bunch of old dioramas." That would be the worst case scenario. It's like, what's new about this? You've basically taken these things and put them in new wrapping, you've given the emperor some new clothes. How do you make sure that never happens and that these older exhibits still feel fresh and new? I think that's a key question.

  I would divide the answer to that into two parts. There's the intellectual experience and then there's the affective or emotional experience [see details below under "Stories and Themes" and "Design/Space Elements"].
  • Scott Sampson

STORIES AND THEMES

Repetitive Theme: Flow of Energy and Cycling of Nutrients

- For the intellectual experience, what do we want? What are the big ideas that you want to get at? We haven't really talked much about that. There's the hotspot area. There's also the repetitive things that you could bring up here. Every ecosystem has plant producers, herbivores, carnivores, and decomposers.

  How does any place work? You have the flow of energy and the cycling of nutrients. We haven't talked about that, but I think you could emphasize that story with lights and talk about the plants and the herbivores interacting and the herbivores and carnivores. Lights could be focused on different parts of those things and be used to tell the story.

  I think that's one really important thing, a repetitive theme so that people can walk out and say, "Wow, I wonder who the herbivores and the carnivores and the plant producers are here?" They approach the world differently because of content you've given them.
  • Scott Sampson

Habitat Loss and Environmental Generational Amnesia

- For the last forty years I've been part of a community about five hours north of here. It's 670 acres of land and I first went there when I was sixteen years old. I get really emotional talking about it. A lot of the land was old growth in the surrounding area. Richard Bugbee was telling us about the sense of loss he felt looking at the mudflats case, and the story of his people losing the mudflats, and Carolyn Finney told us her personal

A Call for Final Comments

- We've done a lot these past few days, though you've reminded us of all the things we have yet to talk about, so that's a little daunting. As a wrap-up we want each of our advisors and invited guests to give us your parting thoughts. They can be whatever you'd like them to be: cheerleading, cautionary tales. I think it would be good to focus on cautionary tales—we all know that the team is doing a good job and we'll tell ourselves that later. What do we need to be thinking about as we go forward?
  • Kathleen McLean

Focus In, Consciously Edit

- Don't bite off more than you can chew. There is a huge temptation in any exhibition project, in part because it's such a team effort and there are so many people involved, to address all of the great ideas and concerns and questions that get raised as you put the exhibition together. All of them are so valid and so interesting that you feel like you want to touch on them all. Of course you can't. You have to make some hard decisions right up front as to what you just aren't even going to be able to address. The more you focus, the more universal it will be. The more personal it is, the more universal it will be. • Matt Matcuk

The Evolutionary Story

• The time content, this evolutionary story, is tougher, but it would be great if people could get the impression that every single ecosystem, including the ones portrayed here and the ones out there, are the result of millions of years of evolution, every single one. That's a tougher thing to do but I think it would be a really good thing. • **Scott Sampson**

A Story of Change

• A lot of people were advising earlier to be very intentional about what story you want to tell and be really bold about that and embrace that and be unapologetic about telling that story. I know that for a lot of people it's a story of loss. I would like to say that it's a story of change. Then let others infer what they will. There's loss in life. A story of change opens it up just a little. I know there's a lot of loss, sadness, doom, but there's a lot of regeneration as well. One of the things we're trying to instill is the possibility of something different. • **Carolyn Finney**

story dealing with her family's loss of land. The story that I've felt emotionally over the years is seeing the loss of habitat, the loss of forest.

You can take any size unit from a 10,000-acre unit or the current allotment of 670-acre units. You see people coming from the more urban areas and they think it's a lot of land because they're comparing it to urban areas. It's already been logged maybe three or four times, but they see there's still some good timber there so they log it again. They subdivide into smaller quantities. They keep 160 acres and sell the rest.

And these are great people, they are great friends, they are environmentalists. They come and look and the land and say, huh, this is a lot of space and there's some good timber here. We all use trees, right? We all live in houses. So they log some and don't take it all. Then they look at the 160 acres and think, that's a lot of land, I don't need that much land, so they subdivide it into plots of 40 acres, and you just see how this process goes.

I've seen this happen north of here through all of the forests. The area above the land I grew up on was old growth and it has been logged six times since I was a kid. It's now eleven-inch trees. It would go lower except the law doesn't allow it. This is eleven-inch trees on sixty-degree slopes, and the last two times I've walked the land I've cried. It's a very painful process.

I started my talk yesterday talking about the issue of environmental generational amnesia. All of what I'm talking about happened within a single generation. It happens very quickly, it happened very quickly. The process that happens across generations is even worse. Kids coming of age in the new conditions don't have the experience, the feeling of loss. That's the shifting baseline that I was talking about.

Some of you from the natural science standpoint have ideas of what the critical natural science issues are. When I think of it as a psychologist, or maybe more broadly as a social scientist, and am asked what is the one critical issue that needs to be addressed, I think it's this thing I've cast as environmental generational amnesia. Others, like Pyle, have written about it as the "extinction of experience." There are a lot of different ways that people have tried to express this idea. I'm not concerned with the labels but with the idea of being able to convey to people that the nature that we think of as so normal to us is already so impoverished. We've lost so much of it so fast, and we're still losing it.

Richard was talking about the mudflats and it's the same scenario, except he's going to die, we're all going to die, and the kids coming of age are going to think that parking lot has always been there. But they're going to get to our age and they're going to have their losses. Unless we can bring that front and center into our activism, into the exhib-

its that you're doing here, I think we're going to miss the social scientific side of what an exhibit needs to be. • Peter Kahn

The Community Aspect, the Human Storyline

- I'm thinking about multiple story lines. I think that this notion of the emotional, the historical and the ecological is a kind of balancing act that you're picking. The part that I'm most invested in is the community aspect of the storyline. The people who are going to be here are the public and the goal is to enhance what that looks like and, as a good teacher knows, to understand what the learners really want to know, do know and can benefit from.

  For me, that's the storyline that tends to get lost all the time. I believe in saving nature, I believe in all of those pieces. I grew up collecting snakes in the wilds of Brooklyn, so I have deep respect for that process and also know that the urban environment can be very rich and make many biologists. But I want to incorporate that storyline loud and clear. I call it humanizing the exhibits. Put a telephone pole where the acorn woodpeckers are. Insert humans into the dioramas. Put some litter on the beach. Insert humans where they've already inserted themselves anyway. To make it pristine is just artifice. That human storyline is something I don't know how to do, but I think you guys can do it, given where you are and how you do things. • Doris Ash

Focusing on and Recreating the Splendor of the Natural World

- This is the first time I've ever been to the Oakland Museum and it's really a wonderful place. I love the fact that you are a multidisciplinary museum, that you have history, art and science and can draw from all of those three. The area that you're dealing with now I think should be unique and stand apart from those, although there is this intersection of art and science, and it's wonderful as a crossroads that you're at right now.

  The wonderful thing that we all do is design exhibits, but they're all about that out there, this wonderful, spectacular world. I think the one thing all of us can agree on and we all share is that common origin of belonging to and being a part of the planet. There's no debate there. We're all stardust.

  I think that oftentimes everything we plan or do revolves around us, and I think this subject matter is bigger than us. We make the natural world revolve around our perceptions, how we feel about it. I think it's time that we focus on the natural world and what it needs and what our responsibilities to it are as well. The exhibit could be, if we designed it correctly, very dark and frightening. The species loss crisis is not going to go away. Human populations are growing. You need to relate to the natural world differently.

Telling the Human-Nature Story and Why California is Special

- The human-nature experience is a huge, deep, rich area which is really important. That can be through habitat stories, urbanization, which is a huge theme, climate change, the hotspot idea. Why this is special, why California is special, is something that really isn't here at all, and probably should be.
  • Christopher Cogan

A Rhythmic Sequence of Experiences

- I'd encourage the team to think of the exhibition as a rhythmic experience overall (not necessarily a story, though it could be a story), as a sequence of experiences that hang together in a meaningful and engaging way.
  • Matt Matcuk

Man's Relation to Animals - A Quote from Henry Beston

• As I was packing to come on this trip, I threw in all of my stuff and files and last night in the hotel I found this, a Xerox of a quote that I love. It's from a book called *The Outermost House* by Henry Beston (originally published in 1928; Owl Books, N.Y., 1992). I think it sums up a lot of what we have been talking about. This was written right after Thoreau's *Walden Pond* and is kind of in that thought process. He stayed in a little shack out on Cape Cod for two years. He writes:

" We need another and a wiser and perhaps a more mystical concept of animals. Remote from universal nature, and living by complicated artifice, man in civilization surveys the creature through the glass of his knowledge and sees thereby a feather magnified and the whole image in distortion. We patronize them for their incompleteness, for their tragic fate of having taken form so far below ourselves. And therein we err, and greatly err. For the animal shall not be measured by man. In a world older and more complete than ours they move finished and complete, gifted with extensions of the senses we have lost or never attained, living by voices we shall never hear. They are not brethren, they are not underlings; they are other nations caught with ourselves in the net of life and time, fellow prisoners of the splendor and travail of the earth." - Henry Beston

• Stephen Quinn

I think what we can do is draw on the world outside the museum and bring that natural world within the walls of the museum to, as best we can with whatever mediums we have, recreate that wonder, that splendor, that emotion. While I was sitting outside participating in these discussions this beautiful little Anna's Hummingbird flew up on the pines and just for a moment I wasn't thinking about what I was going to say next or anything else. I was just focused on the beauty of that hummingbird. Every time I'm outdoors, every time I'm in the field, I feel a physical, emotional and spiritual healing. It's because we're back to our source.

I think if we can nurture and recreate that, first and foremost before anything else, with an immersive effect in the exhibit, then use all of the other medium and specimens to enhance that and build on that, I think you are bound to succeed. • Stephen Quinn

About a Meta-narrative: Use it to Unify or Arrange, but Visitors Won't Get It

• A meta-narrative works for some shows and not for others. The Creation Museum or our own exhibition on the evolution of life on the planet, or biography shows like Einstein or Darwin work spectacularly with the meta-narrative of simple chronology. And they work because that meta-narrative exists before you go in the show. You already know that people are born, live and die. You already know that god created the world in seven days and rested.

For other shows that are more conceptual, like this one, by all means go ahead and craft a meta-narrative. By all means, use that if you wish as a way of unifying the space or arranging your material. I would not expect that more than a small fraction of your visitors will know that that meta-narrative is there. An even smaller percentage, in my experience, care. • Matt Matcuk

Explore How Others Communicate Messages; Best Use of Dioramas

• Travel if possible to whatever degree your budget allows and however cheaply you can do it. I think it would benefit the team greatly to go to a lot of different kinds of places. They can be museum exhibitions, but I would also recommend that you go to other kinds of places that are trying to communicate a message. Look at how a shopping mall communicates. Look at how a prison communicates. Look at how a train station communicates. Learn from those things and pick out what you do or don't want to emulate. As part of that I would encourage the team strongly not to think of this project as: How can we best use all of our dioramas? Instead I would encourage the team to think about: What is the best exhibition experience that we can provide for our visitors, where will the dioramas that we have work best

to do that, and where might be the places, painful as it is, that we may decide not to include some of them? • Matt Matcuk

DESIGN/SPACE ELEMENTS

Under-discussed: The Inside-Outside Connection at the Museum Itself

- Something I feel that was under-discussed is in the spirit of the original design of the museum, which is the outside space and the inside-outside connections. I wonder if in future meetings and discussions we might think about how or if that's going to play into the design. I have ideas, such as expanding the rock garden or having a guide to birds, but I don't want that to get lost in thinking about the design. • Lisa D. White

Designing for Emotional Impact with Lights, Sound and Graphic Backdrops

- For the emotional part, I know that immersion is a real issue, but to my mind it would be a mistake to hire a painter to come and do old fashioned dioramas because I think people would look at those and think, that's so 1950s, even if you did it extremely well. I think the answer is to do something that is sort of in between, to do something more abstract, like floor-to-ceiling photographs.

  For example, if you took a tidal flat and stuck it into a corner (and I would suggest breaking the whole thing up into units so you get these little immersive things), don't try and make a painting that takes off from the diorama and goes backward. Rather, have a beautiful photograph of a tidal flat that's a wraparound that fills the space, and then you have a close-up of it in front of you. Then you have the sounds and you can have the cones of sound.

  Special lighting would be absolutely key, to have lots of different lighting. I love the idea of having multiple lights, so you focus on a pair of things and maybe have something about them, and then focus on another pair because these dioramas are so rich and detailed and the lights can help bring that out and help people see things they wouldn't otherwise see.

  I think you should turn these into immersive experiences that aren't trying to be like outdoors, in the sense that the diorama might not match the imagery behind it. In one place the image might be floor-to-ceiling, in another place you might have a whole series of images. You build in this feel of what it's like to be there. I think that's going to create the emotional experience.

  I like Julie's idea of putting the redwood experience at the end, with benches around so you can sit and contemplate the experience you've just had walking through. • Scott Sampson

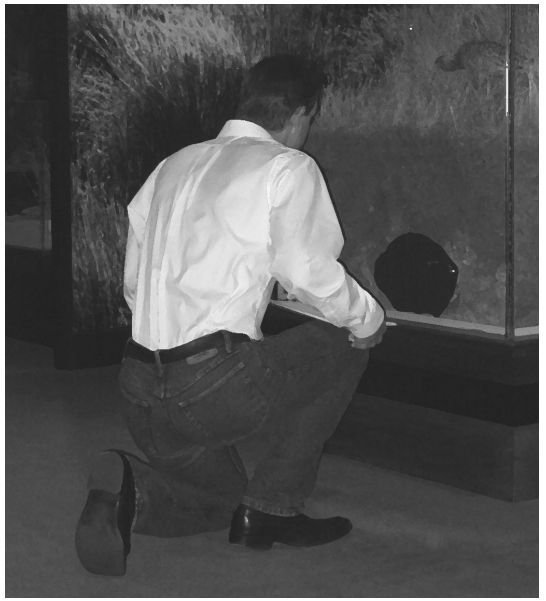
About Using Program and Intervention Ideas to Expand the Experience

- All of these have something to do with the larger experience than just the exhibit. You don't have a lot of money, so there are a finite number of things that you're able to do. There is this tension between trying to make it all happen as the physical part of the experience, which I am not sure is possible, so I'm trying to think of some of these larger pieces. • Julie I. Johnson

Importance of Visitor Feedback

- More important than anything I have to say will be to get actual visitors in there and talk to them and watch them. • Matt Matcuk

Matt Matcuk



Approach to Place: Immersive Dioramas, Experiences

- A sense of place is a pretty compacted phrase and it can mean a lot of things. As I read your preparatory materials and the NSF materials, you made reference to using other people's passions and their sense of place as a way of engendering that same emotion for others. I feel that probably would not be an effective strategy, in large part because of the very great differences in the places that everyone comes from. I do think, however, that you want to create a sense of place in the dioramas that you want to create. Obviously, for some of those you will want to go as far as you can in creating that sense of beauty, awe, wonder, immersion, etc. Again, in our museum when people are asked what they like, it is immersive experiences over and over again. Of course, they use different language, but that's what they like. • **Matt Matcuk**

Using Every Aspect of the Museum to Tell a Multi-layered Story

- Another concept involves the museum as a whole. The experience should start when you cross the sidewalk. I came in yesterday through the parking garage. The parking garage just looks like all of the other parking garages in Oakland. It shouldn't. It should be a museum parking garage.

The garden here is a rooftop grass garden, and that should be part of the museum as well. There's no reason not to use all of that incredible space to further the experience. I would take it even further, to the bathrooms. There's no reason they should look like every other institutional bathroom, even if it's nothing more than what the walls look like.

There's a rich potential to use all of these spaces that could be part of the whole museum experience. You should use every detail, even the drinking fountains. It's water and what more important story is there in California than water? Why have a standard drinking fountain? It doesn't have to be expensive, but there is an opportunity to have many layers of stories, and if you want to engage in it you're given the opportunity. If you don't want to, that's fine, you can just get your drink of water. But there's a rich potential there that could be tapped into to tell the stories. • **Christopher Cogan**

Budget Decisions: Deciding Where to Put the Big Money

- Decide where you're going to spend your money. I don't know what your overall project budget is, but there are exhibition techniques and methods that are expensive and ones that are cheap. Where you've got the big expensive ones (and any changes you make to the dioramas are going to be that way), choose really carefully. Julie had the idea of the redwood forest. I agree with that, that's a big thing. That's one of the most powerful things you have to work with. Choose those things carefully and in the other places, cut back. • **Matt Matcuk**

INTERVENTIONS AND EXPANDED PROGRAM IDEAS

Sharing Multi-generational Memories

- I was thinking about something that Scott also mentioned, the necessity for immersion. I told you all yesterday the story about my parents coming to visit me in Atlanta and going to the Martin Luther King exhibit. It was dioramas, and it was really immersive. It was these separate cones that were connected with replicas of images of people marching and sound and TV images and voices. It was hard not to evoke something.

Then I was thinking about hearing the geese here (from the ambient sound track in the Natural History Gallery). My father had an ongoing war with the geese on the property,

and that came back to me. That's great, but then some people don't have that background experience.

I thought, wouldn't it be great, instead of having children talking to each other, to have an elder and a child talking to each other or somehow sharing that story. It's an opportunity for someone like me who hears the geese to talk about what it reminds them of. It also allows someone else to say that it doesn't remind them of anything. Maybe we should ask, does it remind you of anything? It's another way to get at that experience. • **Carolyn Finney**

Visitor-generated Individual Audio Tours

- One thought I have is about intervention (and I hate that word). On the experience side, I was thinking about something as I listened to some of the audio tracks. There are a number of things here about choice. Each individual's experience will be different from another's. Something you might want to play around with, and this is with an eye toward how you get visitor experience to be part of the experience, but in a way that might be comfortable for people, is to have some visitors do their own audio tour of the experience. Then people can download those. This is Sally's tour and I can go through based on what Sally thought about the exhibit.

  That might be an interesting way for people to interact, not in real time, but to get someone else's perspective. There are those audio tours where you have an adult one and a kid one, and I think those are good and may be interesting, but you might want to play around. Maybe you do it once a year or something during a finite time, and people have to submit their tours and you or a panel of community people get to decide. • **Julie I. Johnson**

Yearly Event: Visitor Creation & Exhibit of Sense-of-Place Dioramas

- Another thought I had is drawn from the hallway gallery in the Education Department. I know the Education Department works with high schools. A curator and a design person get students to create an exhibit element, write their labels, test their labels and install the exhibition. You have experience doing this.

  Again, because you have a finite way you can do certain things and there's this tension between the visitor and the story and so on, maybe once a year you have an event, during which visitors can create their own dioramas of their sense of place. A sense of place is an important construct that you can't do comprehensively in this exhibit. So is there this other way?

  Maybe one year it's families, so you can only submit if you're a family, and it's a family unit's sense of place. Another year it might be adults over fifty. The point is that there

Kudos for the Collection and a Caution About Preservation

- You guys are really lucky with these habitat groups. They're spectacular. I don't think we have anything that compares with them at the American Museum of Natural History because they depict native insects, plants, birds, and the specimens are in beautiful shape because they're fully encapsulated, enclosed in glass. That kind of prevents you from really interacting with them, but there's a warning there. The reason they're as beautiful as they are is because they're inside those glass cases. If you were tempted, as so many museums are, to open them up and make them immersive and interact with them, they're going to fall apart in a very few short years. • **Stephen Quinn**

OMCA Environmental Action Award

• A second idea is, is there an Oakland Museum of California award that you want to create that has something to do with the action of doing something for the environment? The one stake you want to put in the ground is about the hotspot and that something needs to be done. Could the museum actually create an award and recognize Californians for doing something? That's not in the exhibit, but it is about your message in a different way. It should be meaningful, it should mean something that someone gets this award, but maybe you think about that as part of an overarching experience and message. • Julie I. Johnson

Julie Johnson and Lori Fogarty

might be this other kind of thing that you do. You've got to have it for a period time. It looks at sense of place juxtaposed with this other sense of place that you've created.

I was looking at ways to use the exhibition as the starting point in this conversation that you've created, but then there are these other kinds of experiences that help you flesh out and deal with some things that might be harder to do in the physical part of the exhibition. • Julie I. Johnson

From Gray and Drab to a Colorful Kaleidoscope, and Regrouping Cases

• My only caution would be, as Scott said, that the final result just becomes a remix of the specimen cases in the hall. I think you should really look at the hall as an envelope. As you look at the hall right now it's very gray and dark and drab, and that's not what the natural world is. It's spectacular, it's a kaleidoscope of beauty and splendor and wonder. I think the exhibit really has to reflect that.

Maybe there's a way of redesigning cases so that plant and animal communities could be grouped together within those larger cases within the space and are associated with suggestions of these six or seven larger ecosystem hotspots. That might be the way to do it. • Stephen Quinn

IMPRESSIONS OF THE DIORAMAS AND INTERVENTIONS

• I really like the dioramas, but I thought they were disconnected. There were two concepts. One was going north to south and the other was ending up at the redwood forest and they were kind of conflicting. I like the idea of going north to south and showing the footprint that we're leaving. We have an Indian saying that we only leave footprints, you don't leave trash. Even though that's what you guys study, our trash.

The one thing they tell you when you're done basket weaving is to throw the stuff on the ground. Don't put it in the trash can, throw it on the ground. It's a weird concept because you're always telling kids to put things in the trash. But this is basket weaving and now you're hearing the teacher say, throw it on the ground. That's giving it back to the ground and starting the decomposing, the process of recycling nutrients.

My experience with the exhibit was full of emotions instead of information. The rattlesnake one set me off and the mudflats set me off. And the fire really set me off, even though I thought it was backwards and I didn't like the video. But I finally had come to an exhibit where all the plants were named, and it wasn't about the animals, it was about the plants. Besides the tree one, that was the only one about the plants, and how the fire was a cycle of nature. If you

come from southern California, you always see fire as a negative experience, and I always see it as a positive experience. That's nature working. A couple of houses may burn down, but you hope it can burn as much as it can burn. I really liked that idea of seeing the positive because everybody knows the negative aspects of fire.

Overall I like dioramas. You can stay there as long as you want and see something. There's something in the corner, there's something in the back. You don't have a time limit. I know that in museums you people only have so many seconds or minutes to look at an exhibit and then move on or whatever. I never got used to that. I always thought it should be staying there as long as you wanted to. I almost stayed too short at a couple of places. I almost left the woodpecker one too fast. There was another one where I missed the whole thing. I guess there was a video or something that I didn't even see.

As I walked through the exhibit I kept getting drawn to that noise of the seashore. I kept hearing bird songs in there. I was wondering where those birds were coming from and realized it was the sound of the ocean. I kept hearing birds and thought, oh, I must be having a spiritual experience or something. I walked back there about five times because of that sound. I can't even remember what was in there, I just listened to it.

I was also seeing which senses each exhibit stimulated in me. I like the idea of sticking your hand in and touching something. Once you touch something, that experience goes back and back every time you touch something. We use that a lot in language. You stick your hand in and feel it, and you have to say in the language is it soft, prickly, fuzzy or whatever. Any time you stimulate your senses you stimulate everything. • **Richard Bugbee**