12-2015

Sensory History and Multisensory Museum Exhibits

Naomi Reden
State University of New York, Buffalo State College, redenne01@mail.buffalostate.edu

Advisor
Cynthia Conides, Ph.D., Associate Professor of History and Program Coordinator of Museum Studies
First Reader
Cynthia Conides, Ph.D., Associate Professor of History and Program Coordinator of Museum Studies
Second Reader
Sonia Penaranda Gonzalez, M.A., Lecturer of History
Department Chair
Andrew D. Nicholls, Ph.D., Professor of History

Sensory History and Multisensory Museum Exhibits

By

Naomi Reden

An Abstract of a Thesis
in
History with Concentration in Museum Studies

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Master of Arts

December 2015

SUNY Buffalo State
Department of History and Social Studies Education

ABSTRACT OF THESIS

Sensory History and Multisensory Museum Exhibits

Drawing from the work of sensory historians, this paper will explore the importance of the senses in understanding one's surroundings and define what qualifies as sensory experience in a museum setting. Through a combination of research and observations during museum visits, it explores examples of how each sense has been incorporated into museums and exhibits. It presents examples of immersive and interactive exhibits providing multi-sensory experiences, including examples of both effective and non-effective ways in which these elements have been used. It is the author's premise that the museum should remain artifact-centered, and sensory elements should be used to supplement, not replace, collections. Any sensory or interactive element used should provide context for the objects. However, it is desirable for museums to utilize whatever elements possible, including replicas, to try and recreate the sensations and sensory experiences of the past for visitors.

SUNY Buffalo State
Department of History and Social Studies Education

Sensory History and Multisensory Museum Exhibits

A Thesis in
History with Concentration in Museum Studies

By

Naomi Reden

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Master of Arts

December 2015

Approved By:

Cynthia Conides, Ph.D.
Associate Professor of History & Museum Studies
Chairperson of the Committee/Thesis Adviser

Andrew D. Nicholls, Ph.D.
Chair and Professor of History

Kevin Railey, Ph.D.
Associate Provost and Dean
The Graduate School

Table of Contents

List of Figures

1. Introduction

Changes in museum exhibit design over the past few decades have been driven by the move away from the concept of museums as simply spaces for displaying objects to the concept of museums as multisensory experiences.[1] The idea of immersive museum exhibits has been around in one form or another for centuries: the ancient Romans used to conduct reenactments of naval battles in their arenas.[2] Colonel Jean-Charles Langlois' 1830 panorama, *Battle of Navarino*, included wax presentations of sailors along with sound effects supplied by men hiding within the panorama. Naval cadets who viewed it "were considered to have experienced what it was like to be aboard a warship during battle."[3] Sensory immersion experiences within the museum "envelop the visitor in the sounds, smells, sights, textures, and even tastes of a place or event" in ways that objects and text displays alone sometimes cannot.[4] They can include floor-to-ceiling tanks in aquariums, virtual experiences in science centers, and performances by actors in history museums who converse and engage visitors in tasks appropriate to the time period.[5] Sensory elements in exhibitions can range from rides and virtual reality experiences to something as simple as pushing a button to light up sections on a map or lifting a panel to read the answer to a question.[6] Interaction has been the favored technique of many science centers and children's

---

[1]John H. Falk and Lynn D. Dierking, *Learning from Museums: Visitor Experience and the Making of Meaning* (Lanham: AltaMira Press, 2000), 127.
[2]Michael Mouw and Daniel Spock, "Immersive Media: Creating Theatrical Storytelling Experiences," in *The Digital Museum: A Think Guide,* eds. Herminia Din and Phyllis Hecht (Washington, DC: American Association of Museums, 2007), 48.
[3]Edward P. Alexander, *Museums in Motion: An Introduction to the History and Functions of Museums* (Nashville: American Association for State and Local History, 1979), 82.
[4]Falk and Dierking, *Learning from Museums*, 198.
[5]Ibid., 127; Margaret Lindauer, "The Critical Museum Visitor," in *New Museum Theory and Practice: An Introduction,* ed. Janet Marstine (Malden: Blackwell Publishing, 2006), 210.
[6]Barry Lord, "The Purpose of Museum Exhibitions," in *The Manual of Museum Exhibitions,* eds. Barry Lord and Gail Dexter Lord (Walnut Creek: AltaMira Press, 2001), 21.

museums, but there is no reason why history museums and more adult-focused exhibitions cannot utilize this technique as well, and in recent years, they have been doing so. History museums in particular frequently incorporate "living history" and reenactment experiences. There are numerous examples of how particular senses have been incorporated into museums, and of immersive or interactive exhibits which provide a multisensory experience. Incorporating multiple senses is especially important in exhibits about cultures whose heritage is primarily intangible, consisting of music, dance, storytelling, or food, for example.

Following a discussion of sensory history and the study of the senses and their roles in human events, the purpose of this paper is to show through examples how considering all five senses in creating museum exhibits can provide increased access to the museum content and change museums for the better. There has been debate among sensory historians and museum curators between those who think that sensory recreation of the past is possible and desirable and those who do not.[7] Considering the great extent to which people naturally learn about the world around them through senses other than sight, incorporating those senses can help people better understand the information provided in museum exhibits. It is vital to remember that, however significant the objects, in this day and age most museums cannot survive on scholarly displays of objects alone.[8] While the collections are certainly the heart of the museum, in many cases the objects by themselves may not be effective enough at covering particular topics or telling particular stories. Interactive and immersive elements are

[7]Mark M. Smith, *Sensing the Past: Seeing, Hearing, Smelling, Tasting, and Touching in History* (Berkeley and Los Angeles: University of California Press, 2007), 117.
[8]John H. Falk, *Identity and the Museum Visitor Experience* (Walnut Creek: Left Coast Press Inc., 2009), 182.

often crucial in explaining the significance of the collections and supplying interpretive content.[9] Interactive exhibits supplement traditional content and promote unique learning experiences, whether they are the primary focus of the museum or simply play a supporting role.[10] Interactive techniques can be as simple as providing a social interaction component to an exhibit by giving visitors opportunities for discussion, or as complex as a fully immersive virtual reality experience. According to Tim Caulton, interactive exhibits should have "direct and obvious actions and reactions" with clear goals and be intuitive to use, utilizing a "range of interpretative techniques."[11] Museums should maintain a balance between artifacts and interactive elements.

While some exhibitions are purely centered on presenting artifacts, others are created with the goal of creating a memorable experience for visitors. Such experience-based exhibitions do not always include artifacts, or, if included, they are frequently secondary to the "experience" goal.[12] Although many view education as the primary goal of the museum, Lord says that "the criterion for the success of a museum exhibition is whether it has achieved an affective experience, inducing a new attitude or interest, not whether visitors walk away from the museum having learned specific facts."[13] Research shows that visitors prefer active learning experiences to lectures.[14] In many cases, the experience has become the most important part of the museum visit and cannot be created by artifacts alone. Modern exhibition design is often more

---

[9]Neil Kotler and Philip Kotler, "Can Museums Be All Things to All People? Missions, Goals, and Marketing's Role," in *Reinventing the Museum: Historical and Contemporary Perspectives on the Paradigm Shift,* ed. Gail Anderson (Lanham: AltaMira Press, 2004), 181.
[10]Nina Simon, *The Participatory Museum* (Santa Cruz: Museum 2.0, 2010), 5.
[11]Tim Caulton, *Hands-on Exhibitions: Managing Interactive Museums and Science Centres* (London and New York: Routledge, 1998), 28.
[12]Philip Hughes, *Exhibition Design* (London: Laurence King Publishing Ltd., 2010), 30.
[13]Lord, "The Purpose of Museum Exhibitions," 17.
[14]Scott Magelsson, *Living History Museums: Undoing History through Performance* (Lanham: The Scarecrow Press, Inc., 2007), 138.

concerned with creating experiences rather than traditional displays.[15] Kenneth Ames describes exhibitions as "primarily nonverbal, sensory experiences," saying that while visitors "may read the words we write, …they are more likely to be caught up in the multisensory experience we try to provide."[16] Exhibition designers have been increasingly utilizing video and audio technology to create an immersive museum environment.[17] Technology continues to develop, increasing the options available to museums. However, an effort should be made to keep museums artifact-centered, utilizing the available interactive options to provide context and supplementary information for artifacts. This paper will discuss interactive and immersive content in museums and the benefits of adding such sensory elements to museum exhibits while keeping the focus on the artifacts, as well as touching on the concerns of those who oppose the addition of such elements.

[15]Hughes, *Exhibition Design*, 78.
[16]Kenneth L. Ames, Barbara Franco, and L. Thomas Frye, eds., *Ideas and Images: Developing Interpretive History Exhibits* (Nashville: American Association for State and Local History, 1992), 319.
[17]Hughes, *Exhibition Design,* 163.

2. Literature Review

The subject of this paper was in part inspired by an in-depth reading of sensory historian Mark M. Smith's 2007 book. Multiple other sources, mostly journal articles on sensory history, as well as a number of books and journal articles discussing museums and exhibits, visitor experience, and exhibit design and technology were also considered.

In his 2007 book, *Sensing the Past: Seeing, Hearing, Smelling, Tasting, and Touching in History*, Mark M. Smith discusses the importance of the senses in both modern and pre-modern times, including how their roles may have changed with the Enlightenment and the print revolution.[18] He structures the book in a way that reflects the nature and amount of historical work done on each sense, placing the chapters on each sense in the order in which most scholars have historically arranged the senses in terms of importance. Smith, a professor of history, supplements his views with works by a variety of anthropologists, historians, and philosophers as he examines sensory evidence in historical texts in order to understand the full range of meanings people have historically attributed to the senses. His fundamental point regarding sensory history is that the senses can only be understood in their specific social and historical contexts, as sensory history is not only about the history of the senses themselves, but also about the role of the senses in shaping peoples' experiences in the past and showing how they understood their worlds. In his conclusion, Smith discusses the debate among sensory historians and museum curators between those who think the

[18]Smith, *Sensing the Past*.

sensory recreation of the past is not only possible but desirable, and those who either believe it to be impossible or object to it on principle. Smith believes that such sensory recreation is neither possible nor desirable.

New Museum Theory and Practice: An Introduction, edited by Janet Marstine, a professor of art history, is a 2006 collection of essays by curators, archivists, scholars, teachers, and conservators focused on the principles of museum practice and examining current issues in the field.[19] In her introduction, Marstine discusses views of the authenticity of museum objects and what makes them authentic. She writes that meanings of objects can change depending on the context in which they are presented, and believes that objects are frequently framed in certain ways to control how they are viewed by visitors. Marstine discusses the history of new museum theory and the ongoing critique of the museum as an institution. "Spectacle and Democracy: Experience Music Project as a Post-Museum" discusses museums' attempts to expand their audience and become more interactive and more of an attraction through the use of technology. Sound and touch are primary at Experience Music Project, as the museum focuses on providing opportunities for visitors to both listen to and play music. "Revealing and Concealing: Museums, Objects, and the Transmission of Knowledge in Aboriginal Australia" describes the conflict between museum collecting and aboriginal community values, concluding that performance should be the primary interpretation method for indigenous museums. Performance as an interpretive method engages sight and hearing, and sometimes can incorporate taste, smell, and touch. It may also encourage social interaction through audience participation. Marstine defines museum

[19]Janet Marstine, ed., *New Museum Theory and Practice: An Introduction* (Malden: Blackwell Publishing, 2006).

theory, identifying the main archetypes of the museum (shrine, market-driven industry, colonizing space, post-museum), and introduces a debate on whether or not museums can change. This book combines theory and practice as well as calling for a critique of museums.

Pam Locker's *Exhibition Design* explores fundamental topics in exhibition design, using examples from students and professionals, along with diagrams and illustrations.[20] The author is a museum and exhibition designer and consultant in Britain and Europe. This book serves as an introduction to exhibition design and an examination of the role of the designer, with the goal of providing readers with a better understanding of the skills and methods involved in exhibition design and how to apply these skills and methods in real life. Case studies with examples of student work are used to show theory in practice, as well as questions and thinking points that go along with each section. The book contains a brief historical overview of museums, including a section on the modern museum and the realization that museums need to engage with audiences more and allow community participation. Locker discusses the challenge of finding the most appropriate media for communicating the subject matter and the recent emphasis on a crossover between education and entertainment. The development of new interpretation techniques and how stories of human experience have the ability to transform objects into meaningful artifacts and help them connect visitors with the past is presented. The chapters on exhibition media and display were particularly helpful, discussing the use of music and audio to provide a sensory dimension, interactives, and the best ways to display objects (including the use of reconstructions and demonstrations) to make the information easily understood by the

[20]Pam Locker, *Basics Interior Design 02: Exhibition Design* (Switzerland: AVA Publishing SA, 2011).

audience.

Graham Black's 2005 book, *The Engaging Museum: Developing Museums for Visitor Involvement*, is a guide on how to create the best experience for museum visitors, looking at every stage of the museum visit.[21] Black, a lecturer in Museum and Heritage Management and a professional interpretation consultant, writes about audience development, gallery interpretation, and collection displays, including discussion questions, case studies, and charts. He discusses the recent pressure on museums to change the way collections are presented in order to support education, increase access, meet the needs of communities, allow for more visitor participation, and encourage a variety of different audiences to engage with the museum. In short, the subject of this book is the need for the museum to be more audience-centered. According to Black, museums need better knowledge and understanding of visitors in order to accommodate them better. The challenge for twenty-first century museums is to understand the motivations and needs of existing audiences, how to keep visitors coming back, and how to develop new audiences. Black stresses that museums are a part of the service industry and must know how to respond to the needs of different types of visitors, emphasizing the importance of social interaction with docents and museum attendants. He discusses the recent focus on the educational role of the museum and how the museum can be an environment for learning, both for schools and independent visitors. Black has a negative opinion of traditional didactic museum displays, and discusses the importance of experiential learning, considering different learning styles, and discovery learning. He discusses the principles of museum interpretation and an audience-centered approach. His key point is that museums must

[21]Black, *The Engaging Museum*.

adapt to compete with other attractions and must offer a range of experiences to meet the needs of different visitors. Black writes, "Senses are a key means by which we can engage our audiences and add additional unexpected meanings to their visits."[22] Importantly, he discusses what elements other than display need to be taken into account in visitor experience: direct encounters with objects, choosing the best approach to displays, and putting objects in context. For example, he believes that museum exhibits must incorporate opportunities "for visitors to handle objects and discuss them with staff."[23]

In *Sensory Worlds in Early America*, Peter Charles Hoffer discusses the role that the senses played in the lives of various groups of people through a series of essays reconstructing scenes of the past in colonial America. Particular attention is paid to the smells, sounds, tastes, and sights observed by the people in question.[24]
He revisits important events to explore the effect of sensory experiences on human thought and action and show the importance of the senses in understanding historical events. His goal is to show how sensory experiences affected certain important events, by uncovering sensory information in primary sources. The book is meant to show the impact of sensory experience on history, through the examples of conflicts at Roanoke and Jamestown, Indian wars, witchcraft scares, slave rebellions, and the American Revolution. Hoffer uses sensory descriptions to bring these worlds to life, including the sensory detail found in primary sources and the writings of historians of the time. The episodes of colonial history featured in this book are intended to prove the importance of sensory history to our understanding of certain events. Hoffer's descriptions of

[22]Ibid., 206.
[23]Ibid., 150.
[24]Hoffer, *Sensory Worlds in Early America*.

encounters between English settlers and Native Americans include how each group dealt with these new situations and sensory experiences, how they perceived and reacted to each other, and the role of the senses to each culture. In the sections on Indian wars and witchcraft, he discusses the sensory overload of the sights and sounds of war; the sights, sounds, and smells of the villages; and sensory descriptions of the so-called invisible world and spectral evidence in which colonists believed. In the sections on slave revolts and religious awakenings, he discusses slaves' sensory communities, how sensory features defined masters and slaves, sensory prejudices, and how one's culture influences perception of others. Hoffer discusses how new sights and sounds led to new ways of seeing and hearing, the ways in which different groups' sensations and perceptions conflicted with each other's, and how in different cultures, different senses are predominant and the primary way of understanding the world. He visited historic sites as part of his research, and believes that historians who travel to historic sites can use their imagination in combination with observations and research to convey the senses of the past to others. Hoffer believes strongly that historians can and should attempt to replicate the sensations felt by people in the past, for the purpose of understanding how these people made sense of the world.[25] He states that the popularity of historic reenactments and restorations shows that people want to revisit the past. According to Hoffer, it is possible to replicate the sensations of the past and convey them to others, and that the senses can be educated to understand the sensory experiences of people in the past.

[25]Ibid., 2.

3. Overview of Sensory History

According to Smith, sensory history is about the role of the senses in shaping peoples' experiences in the past and showing how they understood their worlds.[26] He describes sensory history as a way of thinking about the past and of becoming aware of the wealth of sensory evidence in many texts.[27] Although many historians mention sights, sounds, smells, tastes, and touches in their writings, Smith believes these references are usually no more than literary flourishes.[28] George H. Roeder, Jr. found in the 1970s that few textbook authors addressed "sensory dimensions of history" and most non-visual sensory content that was present was negative, such as descriptions of bad smells, pain, and noise.[29] Roeder stressed the need to write about the senses in order to increase our understanding of the past. Smith uses the example of historical work on the U.S. Civil War which includes sensory description of sounds such as the booming of cannons, and soldiers screaming, in his statement that the inclusion of sensory description in historic texts is typically added only for "flare."[30] Constance Classen agrees with Smith that the study of sensory history should focus on discovering the meanings that sounds, smells, and other sensations had for people, instead of simply describing these sensations.[31]

Most historians have primarily studied history through sight rather than trying to understand the olfactory, tactile, auditory or gustatory aspects of the past, relying on sight to help them understand the past simply because that is the sense used to locate

[26]Smith, *Sensing the Past,* 4.
[27]Ibid., 5.
[28]Smith, "Producing Sense," 842-843.
[29]Smith, *Sensing the Past,* 7-8.
[30]Mark M. Smith, "Making Sense of Social History," *Journal of Social History* 37.1 (2003): 177.
[31]Smith, *Sensing the Past,* 118.

the information in books.[32] The invention and spread of visual technologies such as telescopes, glasses, and microscopes increased this reliance.[33] However, Smith stresses that we need to appreciate how sight interacted with the other senses to create intellectual meaning in the past.[34] He urges us to remember that, although historians still have a tendency to view the past through vision, senses beside vision have played a role in human affairs.[35]

Sound was critical to daily life in early modern Europe and colonial America. Hearing in conjunction with seeing helped people locate themselves in space and time, and familiar sounds and timing established the idea of community: for example, Christian parishes were often defined by the distance at which church bells could be heard.[36] In the ancient and medieval world, hearing was considered to be the sense that could reveal truth the most accurately, at times more accurately than sight.[37] The invention of recorded sound in the early twentieth century was an important cultural and technological development that had significant implications for our understanding of hearing and its relationship to vision.[38]

Smell has had a great deal of importance to a number of societies throughout history, but there is little historical writing on it.[39] It has historically been used to mark urban-rural distinctions, and for the ancient Romans, different smells marked public spaces and celebrations as well as religious events and individual rooms within the

---

[32]Ibid., 20.
[33]Ibid., 25.
[34]Ibid., 29.
[35]Smith, “Making Sense of Social History,” 166.
[36]Smith, *Sensing the Past,* 43-45.
[37]Ibid., 57-58.
[38]Ibid., 55.
[39]Ibid., 59.

home, helping to define space.[40] Elsewhere in the premodern West, smell was the sense most associated with truth and knowledge.[41] Scent was believed to be an authenticator of truth, a source of knowledge, and used to shape social relations, differences, and ideas of self and national identity.[42] The sense of smell is thought to have a strong influence on memory, more so than sight or hearing.[43] Dennis Waskul, Phillip Vannini, and Janelle Wilson examined the link between smell and nostalgic memories in a 2009 study, collecting data through the use of research journals in which participants were asked to record their olfactory experiences over a period of two weeks.[44] Waskul, Vannini, and Wilson found that reminiscences and feelings of nostalgia were a frequent result of experiencing certain smells, demonstrating that smelling has a significant role in the recollection of past events or experiences.

While in the West we learn to identify different plants primarily by visual recognition, in certain societies where herbal medicine is commonly practiced, people learn to identify the differences between plants by smell.[45] Similarly, while the sense of taste is not commonly viewed as educational in Western culture, it is quite the opposite in other parts of the world. For example, the enjoyment of tea during the Japanese tea ceremony is considered to be a vital educational experience, one that "is thought to have the potential to lead to a higher level of consciousness than could be achieved through many years of listening to lectures and studying texts."[46] Smith writes that the

---

[40]Ibid., 70, 61.
[41]Ibid., 59-60.
[42]Ibid., 74.
[43]Ibid., 64; Hoffer, *Sensory Worlds in Early America*, 5.
[44]Dennis D. Waskul, Phillip Vannini, and Janelle Wilson, "The Aroma of Recollection: Olfaction, Nostalgia, and the Shaping of the Sensuous Self," *Senses and Society* 4.1 (2009): 5-22.
[45]Constance Classen, "Other Ways to Wisdom: Learning through the Senses across Cultures," *International Review of Education,* Vol. 45 No. 3/4 (1999): 273.
[46]Ibid.

sense of taste, like smell, informed class identity, ideas about gender and race, and esthetic taste and judgment, giving meaning to modern ideas about ethnic and national identity.[47] As more of the world was being discovered, new foods and tastes arrived in Europe and North America and began defining national and ethnic identities as the varied ethnic groups adapted to foods and exchanged culinary practices and tastes, resulting in multi-ethnic cuisines.[48] In comparison, in some other ethnic groups, taste gave meaning to space and location, such as the importance of regional cuisines in China, or the example of Greek immigrants bringing food from their homes with them wherever they moved, thus relocating their sense of national identity.[49] For these reasons, Smith believes paying attention to taste could help us better understand how the senses have informed modern ideas about ethnicity and national identity.[50]

The sense of touch has been just as important to the development of the modern world as sight.[51] Books are not just visual, but have strong tactile importance as well.[52] The physiologist Philippe Pinel in 1800 referred to the sense of touch as "the sense of the intellect," and in some instances including medical treatments it was thought to be more reliable than sight.[53] Immanuel Kant believed that since touch was a physical sense, it was the true way to knowledge because of its directness, while sight was detached and reflective.[54] In seventeenth and eighteenth-century accounts of the senses, touch was the most referenced after sight. In the eighteenth century, vision

---

[47]Smith, *Sensing the Past,* 74-75.
[48]Ibid., 82-84.
[49]Ibid., 78.
[50]Ibid., 87.
[51]Ibid., 116.
[52]Ibid., 93.
[53]Ibid., 31.
[54]Constance Classen, "Museum Manners: The Sensory Life of the Early Museum," *Journal of Social History* (Summer 2007): 904.

was thought to be the most intellectual sense, but many still thought touch to have the best access to reality.[55] However, by the end of the eighteenth century, touch had become the sense associated with the irrational and the direct proximate understanding of the world.[56] One major use of touch throughout history has been to claim ownership, contributing to the idea embedded in Western culture that touching equals possession.[57] This goes along with the fact than in nineteenth century museums (and the majority of museums today), visitors were urged to look at but not touch artifacts.[58]

Historians engaged in studying the senses have mostly focused on one particular sense rather than the senses as a whole.[59] In addition, very few have focused on taste, touch, and smell (the so-called "lower" senses), but mainly on the supposedly "higher" senses of hearing and seeing.[60] The senses of smell, taste and touch have generally not been considered educational by Western standards, but merely "channels for pleasure or displeasure."[61] Evolutionary theorists in the nineteenth and early twentieth centuries suggested that as societies became more "civilized," smell became less important in acquiring knowledge.[62] The general belief was that the "civilized person" understood the world through sight and hearing, and that smell, taste, and touch were of little or no help in this understanding. However, while smell, taste, and touch are typically not given much importance in Western education, in other cultures each sense "has a vital role to play in the acquisition of knowledge of the world."[63] In societies

---

[55]Ibid., 901.
[56]Smith, *Sensing the Past,* 100.
[57]Ibid., 96-97.
[58]Ibid., 114.
[59]Smith, "Producing Sense," 842-844.
[60]Ibid.
[61]Classen, "Other Ways to Wisdom," 271.
[62]Ibid., 272.
[63]Ibid., 269.

where speech is the main form of communication, hearing, tactility and olfaction are most important since people group together to talk, and therefore touches and smells combine with sounds to create a "synesthetic" communication. In writing-based societies, vision and tactility are primary.[64] Classen points out that while in Western culture, sight and hearing are considered the "educational senses," in other cultures people frequently use other senses to learn about their surroundings. She also warns against treating both spoken and written language as excessively visual and aural-oral, since writing was tactile and visual and speech was often olfactory as well as oral, and emphasizes that both "hand" and "eye" knowledge are important in learning about the world.[65]

[64]Smith, *Sensing the Past,* 9.
[65]Ibid., 12-13; Classen, "Other Ways to Wisdom," 274.

4. Sensory Experience in Museums

Graham Black writes that there are limits to what sight can reveal, and that "people are highly selective in what they look at and read."[66] The other senses can contribute a great deal both to the enjoyment of a visitor's experience in the museum and to their understanding of the subject matter, just as people use all of their senses to understand and connect to each other and the world around them.[67] According to Black, museums can bring the past to life for visitors by linking the senses to emotion:

> "The opportunity to touch something made or used by another human being thousands of years ago, to smell and listen to the 'normal' sounds in an eighteenth century living history site, to listen to period music in the long gallery of an historic house. A written text can never provide an adequate substitute."[68]

Many museums introduce sensory and interactive elements into their exhibitions and programming in order to encourage education, in particular considering visitors who do not react favorably to a traditional didactic approach.[69] Demonstrations, whether of scientific experiments and processes at science museums, or of crafts (such as spinning and weaving) and gardening at outdoor museums, can greatly enhance the museum experience.[70] These demonstrations can be much more interesting and informative than a lecture or purely verbal discussion of the same process, however well-versed the speaker may be on the topic.[71] According to Caulton, visitors enjoy hands-on exhibits much more than more traditional exhibits, as proven both by visitor

---

[66]Black, *The Engaging Museum*, 204.
[67]Ibid.
[68]Ibid, 205.
[69]Fiona Candlin, "Don't Touch! Hands Off! Art, Blindness and the Conservation of Expertise," *Body & Society* 10.1 (2004): 72.
[70]Kotler and Kotler, "Can Museums Be All Things to All People?" 181.
[71]Alexander, *Museums in Motion*, 199.

numbers and recorded visitor responses to museums which provide these opportunities.[72]

According to Yves Mayrand, smell is the most ignored sense in museum exhibitions, but since smell can be quite powerful in triggering memories, "using it appropriately can add to the visitors' experience of and attention to the content."[73] Smells can be added intentionally into museum exhibits. A 1999 exhibition on food at the Hamburg Speicherstadtmuseum piped smells of sugar, beer, wine and tobacco through a tube on the ceiling, and in 1984, at the remains of the Viking city of Jorvik, curators managed to recreate the smells of the village, including the Viking latrine, with scratch and sniff cards.[74] Budapest's Museum of Catering in 1994 contained confectionary exhibits which smelled of vanilla due to an essence rubbed on the furniture.[75] In other situations, smells are incorporated unintentionally, such as the ambient "museum smells" of scented wood, musty smells from animal remains and plants in exhibits, old books, or, as one may experience in the Hockey Hall of Fame in Toronto, the faint smell of old hockey equipment that the display cases cannot completely mask.[76]

Taste can be difficult to incorporate into museums. However, many museum visits in the seventeenth and eighteenth centuries involved meals served to visitors, and themed cafes and restaurants within museums today can serve the same function.[77] For example, Colonial Williamsburg offers "authentic" food at Williamsburg taverns;

---

[72]Caulton, *Hands-on Exhibitions*, 17.
[73]Yves Mayrand, "The Role of the Exhibition Designer," in *The Manual of Museum Exhibitions,* eds. Barry Lord and Gail Dexter Lord (Walnut Creek: AltaMira Press, 2001), 411-412.
[74]Smith, *Sensing the Past,* 119-120.
[75]Alexandra Shelley, "Budapest's Museums of Everyday Life," New York Times (23 October 1994): 26.
[76]Classen, "Museum Manners," 904; museum visit, August 2011.
[77]Classen, "Museum Manners," 904.

while the food may not be exactly the same as what people in the colonial time period used to eat, it can still add an authentic feel to the visit.[78] The National Museum of the American Indian in Washington, DC does an excellent job of this as well, through their onsite restaurant, the Mitsitam Native Foods Café. This restaurant has proven very successful and popular with visitors. According to Larry Ponzi, the general manager of the restaurant in 2004, "The menu is designed to be consistent with the mission of the museum, which is to educate visitors about Native American life and culture. The selections are as authentic as possible down to their authentic ingredients."[79] Mitsitam Native Foods Café uses organic, free-range, and natural ingredients as much as possible in order to maintain the authenticity of the food options, which include dishes from all five geographic regions represented in the museum exhibits. To further educate visitors, "food facts" about Native American food are left on the tables each day.[80] The opportunity to eat native foods can enable visitors to connect to the cultures represented at the museum in a way that observation of the exhibits alone may not. Another way to incorporate taste in the museum is by displaying recipes in exhibits or selling cookbooks in the gift shop that are from the appropriate time period or somehow associated with the subject of the exhibition or museum. The museum at San Quentin Prison in California sells the inmate-written *Cooking with Conviction*, while the Museum of Catering and Commerce in Budapest, which opened in 1966, contained recipes in the archives which were available for pastry chefs to peruse.[81] Two other European museums incorporate taste in a very simple and enjoyable way, albeit for adults only.

---

[78]Smith, *Sensing the Past,* 120.
[79]Food Management, "Museum cafe more than just a place to eat: authentic cuisine, food facts contribute to new American Indian Museum's educational mission," Food Management (2004): 8.
[80]Ibid.
[81]Marstine, *New Museum Theory and Practice,* 3; Shelley, "Budapest's Museums of Everyday Life," 26.

At the Guinness Storehouse in Dublin, the tour ends with the experience of sitting with a pint of Guinness and looking out over the city.[82] Similarly, the House of Bols Cocktail & Genever Experience in Amsterdam supports its exhibits on the history and making of its brand with interactivity including the opportunity to smell different varieties of the brand, and ends with a visit to the bar to drink a Bols cocktail.[83] Up to 90 percent of what we consider to be taste is in fact due to our sense of smell.[84] Therefore, a combination of descriptions in the exhibit labels, copies of historic menus, and smells "can allow us to contrast past preferences with those of today and give an alternative insight into past lives."[85]

In contrast to taste and smell, sound in museum exhibits is quite easy to incorporate and has been prevalent for years. As early as 1904, curators began recommending the use of phonograph recordings in exhibitions as audiovisual aids to provide contextual information.[86] Pam Locker describes how the use of sound in museums can add another dimension to the experience:

> "The echoing sound of dripping water will make a recreated dungeon feel cold and wet, whilst the sound of seagulls and laughter is reminiscent of a day at the seaside. Like light, ambient sound effects and soundscapes evoke atmosphere and feeling that enhance the narrative. A conversation overheard in a historic house from a door ajar to the kitchens, supported by the banging of pots and the smells of cooking, helps us to imagine what the kitchen was like, even if it cannot be seen."[87]

Often, sound is incorporated into exhibits along with other elements. According to Mary Hutchison and Lea Collins, sound is integral to exhibit design, and the role of sound

---

[82]Hughes, *Exhibition Design,* 61.
[83]Locker, *Exhibition Design,* 67.
[84]Black, *The Engaging Museum,* 204.
[85]Ibid.
[86]Alison Griffiths, *Shivers Down Your Spine: Cinema, Museums, and the Immersive View* (New York: Columbia University Press, 2008), 235.
[87]Locker, *Exhibition Design,* 96.

installations in historical museum exhibits is to supplement the exhibition experience.[88] Hutchison, a writer and exhibition curator, and Collins, a composer and sound designer, collaborated on Bonegilla Voices and Migration Memories, experimental sound installations developed as components of exhibits about Australian migration history. Bonegilla Voices was part of an exhibition about a 1947 Australian immigrant training and reception center. Material from government records was used to show the policies and process of immigration at the time, and the sound installations were intended to highlight a collection of immigrant records, including personal memories of the immigrant experience. Hutchison and Collins state emphatically several times that the sound installations were meant to combine and interact with the visual and written elements, and not meant to stand alone. Evidently, visitors appreciated the sound of the voices since it animated the text and gave the exhibit another dimension. The goal of the methods they used was to "show cultural diversity as an interactive experience rather than a static display of cultures."[89]

When used appropriately, music can have a tremendous influence on the way visitors react to exhibits.[90] Music has the potential to evoke a powerful emotional response in visitors, and some museums take advantage of this by playing period music on authentic instruments in the galleries.[91] Others provide music-related programs, demonstrations, and concerts, or provide electronic devices to visitors that play musical recordings made on the very instruments displayed in front of them.[92] The Buffalo

---

[88]Mary Hutchison and Lea Collins, "Translations: Experiments in Dialogic Representation of Cultural Diversity in Three Museum Sound Installations," *Museum and Society* 7.2 (2009): 92-98.
[89]Ibid., 92.
[90]Black, *The Engaging Museum*, 205.
[91]Alexander, *Museums in Motion,* 199.
[92]Ibid., 217.

History Museum's historic Steinway piano, for example, is played at special receptions and exhibition openings. Musical instruments need to be played to be fully appreciated, and some musical instruments are actually preserved better if played, like they are at the Smithsonian's Museum of American History.[93] At some museums such as the Rock and Roll Hall of Fame in Cleveland, the sound and performance of the artist is the artifact more than the guitars on display.[94] Another example is Experience Music Project, known as EMP, a "technology-driven spectacle" founded by billionaire Paul Allen, which opened in June 2000.[95] One of the main concepts guiding EMP is that since people have diverse learning styles and technology has multi-layered ways of providing information, EMP's presentations should engage people in as many different ways as possible in order to facilitate learning, such as presentations of live concerts and interactive zones where visitors play instruments and record their own music.[96] Artifacts are still present, but these other elements serve to create a new museum experience which revolves not so much around the object as around the experience given to the museum visitor. As Chris Bruce writes, "an artifact may serve as the representative of a song or the personalities who created the song, but it is peripheral to the reason the institution exists, which is to celebrate music."[97] The sensory experience is central in this case, rather than the artifacts.

---

[93]Classen, "Museum Manners," 904; Elaine Heumann Gurian, "What Is the Object of This Exercise? A Meandering Exploration of the Many Meanings of Objects in Museums," in *Reinventing the Museum: Historical and Contemporary Perspectives on the Paradigm Shift,* ed. Gail Anderson (Lanham: AltaMira Press, 2004), 277.
[94]Gurian, "What Is the Object of This Exercise?" 277.
[95]Chris Bruce, "Spectacle and Democracy: Experience Music Project as a Post-Museum," in *New Museum Theory and Practice: An Introduction,* ed. Janet Marstine (Malden: Blackwell Publishing, 2006), 129.
[96]Ibid., 134-149.
[97]Ibid., 147.

Interactivity is vital in certain museums, as presenting museum artifacts out of context can be detrimental to the preservation of culture. Many Native Americans argue that accessioned material should be used in ceremony and tradition.[98] The traditional role of some objects involved performance, and for many indigenous people, preservation of intangible cultural heritage such as oral history, dance and music is a priority over preserving physical artifacts.[99] For many African-American and Native American populations, whose culture is often transmitted though oral language, dance and song rather than through objects, museums that wish to portray these cultures accurately or without much available material evidence need to use more diverse material.[100] In addition, indigenous museums may use storytelling, song, and recitation as primary methods of interpreting the available objects since they are more culturally appropriate than written texts.[101] In some cases, videos of ceremonies and audio of chanting have been taking on the role and function typically played by artifacts.[102] This immersion allows the visitors to become participants in the culture, rather than simply passive observers.

Nina Simon writes that live interpretation or performance, or even simply asking visitors questions and encouraging them to share their reactions to the objects, activates artifacts as social objects and is important in helping visitors make a personal connection to artifacts.[103] Barry Lord also found that according to visitor surveys, the

---

[98]Gurian, "What Is the Object of This Exercise ?" 277.
[99]Moira G. Simpson, "Revealing and Concealing: Museums, Objects, and the Transmission of Knowledge in Aboriginal Australia," in *New Museum Theory and Practice: An Introduction,* ed. Janet Marstine (Malden: Blackwell Publishing, 2006), 154, 163.
[100]Gurian, "What Is the Object of This Exercise?" 276-277.
[101]Simpson, "Revealing and Concealing," 163.
[102]Gurian, "What Is the Object of This Exercise?" 276-277.
[103]Simon, *The Participatory Museum,* 138.

most satisfying interactive exhibits are those which include social interaction.[104] Experiencing this personal connection is often vital in order to hold the interest of the museum visitor through effective story-telling. According to Simon, "artifacts and experiences are all social objects," and therefore all museums have the ability to provide social experiences.[105] These social experiences do not need to be high-tech and can be as simple as the "share your story" display in the Buffalo and Erie County Naval & Military Park museum, which allows visitors to sit at a military field desk and share their personal experiences on Post-It notes which are left on display for others to read.[106]

According to Black, multisensory elements are quite helpful in increasing visitors' understanding of the exhibits.[107] In particular, he emphasizes the importance of providing visitors with items to touch that can be associated with the objects, if it is not possible to allow handling of the objects themselves. At the New England Aquarium, the "How Cold is the Water?" display at the penguin exhibit invites visitors to guess how cold the water in the penguin habitat is, providing a map with a comparison of water temperatures in various cold climates, and including a metal bar kept to the same temperature as the habitat for visitors to touch and feel how cold the water is.[108] (Figure 1)

[104]Lord, "The Purpose of Museum Exhibitions," 21.
[105]Simon, *The Participatory Museum,* 127.
[106]Museum visit, September 2012.
[107]Black, *The Engaging Museum,* 280.
[108]Museum visit, August 2013.

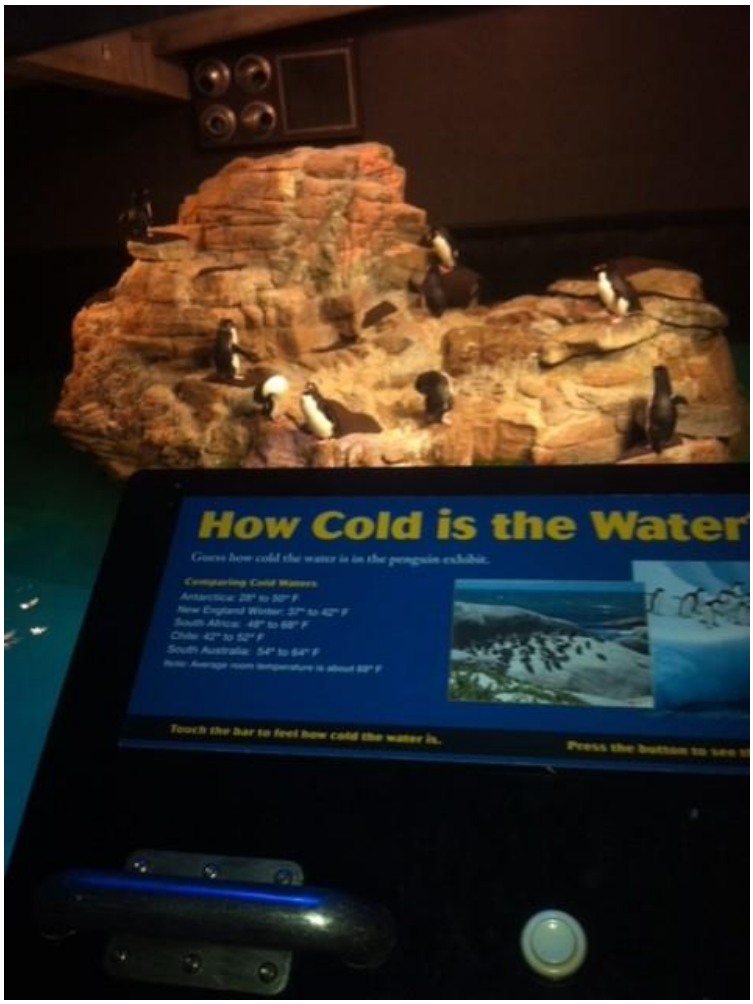

Figure 1
Photograph by Naomi Reden, courtesy of New England Aquarium

In addition to being educational, hands-on displays acknowledge the tactile pleasure of handling exhibit objects, and since "physical contact is an essential part of humanity," touch should be an essential element in museums. [109]

The well-known saying "seeing is believing" is a shortened version of the old English phrase "seeing is believing, but feeling is the truth."[110] Therefore, touch is a critical part of historical experience. It is interesting that simply shortening this popular saying changed its meaning so drastically. This sheds a whole new light on the value

[109]Griffiths, *Shivers Down Your Spine,* 180; Black, *The Engaging Museum,* 204.
[110]Smith, *Sensing the Past,* 93.

historically placed on sight in comparison to that placed on touch. The early Renaissance sculptor Lorenzo Ghiberti believed that sculpture was inaccessible to sight and needed to be touched to be understood, since through sight one could only perceive the surface and could not truly experience the sculpture.[111] Benedetto Varchi, a sixteenth-century Florentine historian, also suggested that only through touch could one fully appreciate sculpture.[112]

4.1 History of Touching in Museums

Museum visitors in the sixteenth and early seventeenth centuries were often allowed to touch artifacts.[113] Museums did not want to forbid it because touch was believed to be an essential means of acquiring knowledge, as it could provide facts about the artifacts that sight alone could not reveal. In her 2007 article, Classen investigated patterns of visitor interaction with museum collections from the mid-sixteenth to the end of the eighteenth century.[114] She acknowledges that visual perception played a dominant role in sensory experiences of visitors, but examines what else museum-goers might have done besides look. Many references in seventeenth and eighteenth century accounts of the Ashmolean Museum in Oxford include comments from visitors on tactile properties of artifacts.[115] The main attraction of museums was their "ability to offer visitors an intimate physical encounter with rare and

[111]Ibid., 113.
[112]Constance Classen, "Touch in the Museum," in *The Book of Touch,* ed. Constance Classen (Oxford and New York: Berg, 2005), 279.
[113]Smith, *Sensing the Past*, 115.
[114]Classen, "Museum Manners," 896.
[115]Ibid.

curious objects."[116] Touch was mainly used to supplement vision since visual impressions of texture could be confirmed by tactile observations, emphasizing that touch was understood to be the sense of certainty, which gave it an advantage over sight.[117]

The Ashmolean Museum allowed visitors to handle artifacts as late as 1827, provided the visitor had the permission of the curator. The sense of touch was associated with possession, and as a sign of good will, this privilege was often extended to others: it was customary for collectors to allow visitors to handle the collections, and as many of the first museums originated as private collections, they continued this custom.[118] In early museums, visitors were considered guests of the curator, and as such were expected to ask questions and handle the objects in order to show their interest.[119] The curator in turn demonstrated hospitality by allowing visitors to touch the objects.[120] While curators were not always happy about having visitors handling artifacts, the social etiquette norms of the time meant that they typically permitted it despite any personal reservations.[121] In addition, since curators' salaries typically came out of entrance fees, they had incentive to continue allowing this to occur.[122] Tactile access was also considered important enough to outweigh the risks to the integrity of the collections.[123] Conservation was not a high priority in early museums. In the seventeenth and early eighteenth centuries, it was not typically thought necessary for

[116]Ibid., 897.
[117]Ibid., 900.
[118]Ibid., 898-899.
[119]Classen, "Touch in the Museum," 275.
[120]Ibid., 276.
[121]Ibid., 280.
[122]Ibid., 276.
[123]Classen, "Museum Manners," 899.

museums to keep art and artifacts in the original condition.[124] Museum collections during this time were often housed in damp or otherwise poor conditions and the objects were frequently subject to deterioration.[125]

The once-common practice of touching museum artifacts was largely disapproved of by the mid-nineteenth century, corresponding with an increased concern for conservation.[126] In England, this shift from multi-sensorial to visual appreciation of art happened between the 1780s and the 1840s.[127] In the 1780s, museum visitors were still accustomed to touching artifacts to see their texture and weight, but by the 1840s, touching exhibits was seen as uncivilized and damaging while only looking was permissible. This was in part due to the fact that museums were becoming increasingly public in nature, which made it more difficult for curators to control both the quality and quantity of visitors to the collections.[128] Therefore, the elimination of the opportunity to touch was deemed necessary. The nineteenth century also saw an increase in concern about damage to the collections, which led to the creation of conservation programs.[129]

The understanding that touching is an essential means of acquiring knowledge has been resurrected recently in many museums, where visitors have been allowed or even encouraged to touch certain artifacts. Smith's opinion is that this is mostly because the reintroduction of touching helps increase the number of visitors, thus increasing funding provided to the museums.[130] While in some cases this may very well be a factor, the increased value of museums as educational institutions appears to be

---

[124]Classen, "Touch in the Museum," 280.
[125]Ibid.
[126]Classen, "Museum Manners," 897.
[127]Smith, *Sensing the Past,* 24.
[128]Classen, "Touch in the Museum," 281-282.
[129]Ibid.
[130]Smith, *Sensing the Past,* 115.

the most likely cause for this change. One way of introducing touch into the museum experience is with "discovery rooms" where small groups can interact with objects outside the rest of the museum. Black defines discovery learning as "a form of active, experiential learning most commonly recognized in problem-solving, enquiry-based and 'hands-on' environments."[131] In 1983, one of the first experimental discovery rooms was opened at the Royal Ontario Museum. The discovery room included open displays of specimens, "discovery boxes," a touch wall, and scientific equipment which allowed visitors to more closely examine the objects.[132]

Another example of the reintroduction of touch into the museum is the 2008 study "Heritage in Hospitals," conducted by University College London Museums & Collections and University College London Hospitals Arts. Participants in the project took museum objects to hospital patients to assess whether handling the objects had a positive impact on the patients' wellbeing. Said objects included natural history and geology specimens, archaeological artifacts, and artworks such as etchings. Handling of the objects was guided by facilitators (a mix of staff and volunteers) who asked the patients questions about the objects (after both facilitators and patients had washed their hands in preparation for handling). It clearly had a powerful effect, as some patients became very attached to the objects and did not want to return them. Patients would handle objects to determine texture and weight and to verify the attributes that they perceived with their eyes, but would also handle them the way they would have been handled, such as pretending to apply kohl from an ancient Egyptian cosmetic pot or making stabbing motions in the air with a dagger. This project demonstrated that

[131]Black, *The Engaging Museum*, 138.
[132]Caulton, *Hands-on Exhibitions*, 35.

handling museum objects can have a positive impact on wellbeing, and in addition, revealed the different ways in which museum objects can be handled. Tactile access to objects enables people to imagine other senses associated with certain objects, such as when one subject imagined the smells emanating from the ancient Egyptian cosmetic pot that she held in her hands.[133]

4.2 Immersive Museum Experiences

In order to effectively reach visitors on an emotional level, exhibitions need to incorporate a full range of sensory perception.[134] Mayrand points out that the fact that most exhibitions use only sight places them in direct opposition to the observation that humans are naturally multisensory and constantly use the full range of our senses in every aspect of our lives.[135] Immersing visitors in a variety of sensory elements "forces them to engage directly with the exhibition and its theme."[136] Visitors engage with exhibits in ways they are accustomed to engaging with the world.

Lord writes that visitor experience is affected by the physical setting of the museum, as location often "conveys a message about the museum's exhibitions, its relationship to the natural environment and to its community."[137] Falk and Dierking use the example of an exhibit at the Seattle Aquarium entitled *Sound to Mountain*, which was partially exposed to the outside, so sunlight, wind and rain could sometimes filter

[133]Helen Chatterjee, Sonjel Vreeland, and Guy Noble, "Museopathy: Exploring the Healing Potential of Handling Museum Objects," *Museum and Society* 7.3 (2009):164-177.
[134]Alexander, *Museums in Motion*, 12.
[135]Mayrand, "The Role of the Exhibition Designer," 411.
[136]Hughes, *Exhibition Design,* 163.
[137]Barry Lord and Gail Dexter Lord, *The Manual of Museum Exhibitions* (Walnut Creek: AltaMira Press, 2001), 69.

in.[138] The sound of water rushing, the sight and feel of mist rising from a re-created mountain stream and waterfall, a live display of otters and fish, and the presence of trees and rocks came together to create an "outdoorsy feel" and enabled visitors to gain a better understanding of the exhibition subject. The location of the museum near the water assisted in visitors' comprehension of the exhibit's explanation of the water systems and environment of the Seattle region, extending from the Puget Sound to the Cascade Mountains.[139] At the Charlestown Navy Yard, just outside of Boston, Massachusetts, the U.S. Navy maintains the U.S.S. Constitution, the oldest commissioned warship still afloat in the United States. Navy sailors wearing reproductions of the original 1813 uniforms give tours of the ship, providing the immersive experience of being below deck of a historical ship while simultaneously learning about its history.[140] Similarly, the Buffalo and Erie County Naval and Military Park provides an immersive museum environment – particularly, the opportunity to explore three different warships – which makes for an enjoyable learning experience.[141] Visitors are able to explore the ships at their own pace, although they must be willing and able to handle small spaces, climbing over doorways and up and down ladders, and heights. The museum itself contains interactive and immersive elements as well. For example, the World War II exhibit is housed in an army tent, and features a large map in the center of the exhibit showing where important events happened, where visitors can press a button to light up the location of the event. This exhibit also contains army uniforms for visitors to try on. (Figure 3)

---

[138]Falk and Dierking, *Learning from Museums*, 198.
[139]Ibid., 198-199.
[140]Museum visit, August 2013.
[141]Museum visit, September 2012.

Figure 2
Photograph by Naomi Reden, courtesy of Buffalo and Erie County Naval & Military Park

Another example of an immersive museum experience is the Dybbøl Battlefield Centre, opened in southern Denmark in 1992, which used audiovisual media and full-size outdoor reconstructions to recreate an 1864 Danish fortress.[142] Mads Daugbjerg describes it as a "counter-museum" which makes heritage communication subjective, personal and multi-sensory, as compared to the image of museums as primarily visual institutions of objects exhibited to be simply looked at. Visitors need to "immerse themselves physically; they need to smell the gunpowder, hear the thundering guns, and feel the fleas in the hay-filled sleeping huts of the Danish 1864 soldiers."[143] While

[142]Mads Daugbjerg, "Playing with Fire: Struggling with 'Experience' and 'Play' in War Tourism," *Museum and Society* 9.1 (2011): 19.
[143]Ibid., 20.

hopefully we do not go so far as to experience the fleas, this concept of immersion can lead to the creation of a wonderfully multisensory museum experience. In particular, families with children were very enthusiastic about the physical experience afforded to them with the reconstructed buildings, which they investigated by touching and smelling the wood and climbing up and looking out of the windows.[144] In addition, replica cannon firings at historic reconstructions are an example of a great multisensory experience that can be seen, heard, felt, and smelled.[145] Old Fort Niagara in Youngstown, New York provides a similar experience, with original eighteenth-century buildings and musket firing demonstrations, along with the "living history" elements of reenactors and artisans.[146]

4.3 "Living History" Museums

The term "living history" is used to describe "individuals or groups that engage in practices that evoke a different historical time from the present."[147] This can include military reenactment groups, renaissance festivals, and living history museums, all of which may incorporate costuming, reenactment of battles, or period craft demonstrations. First-person interpretation is particularly popular in outdoor history museums.[148] Interpreters will frequently perform everyday activities of the time while talking about their daily life. Occasionally, visitors are invited to also put on period costumes and join in participating in period activities. This "second-person interpretation" can include various hands-on activities such as food preparation, farming

[144]Ibid., 23.
[145]Ibid., 27.
[146]Old Fort Niagara, accessed October 3, 2015, http://www.oldfortniagara.org.
[147]Magelsson, *Living History Museums*, xx-xxi.
[148]Alexander, *Museums in Motion*, 200.

chores, crafts, period games, and rides.[149] Old Fort Niagara offers a number of educational programs which incorporate various participatory activities including handling of historic artifact reproductions, infantry drill exercises, and cooking.[150]

Skansen, in Stockholm, Sweden, was the first outdoor museum, opened in 1891 by collector Artur Hazelius.[151] Skansen began in 1873 as the Museum of Scandinavian Folklore, consisting of Hazelius's collection of furniture, costumes, and paintings. As the collection grew and Hazelius obtained entire buildings and other artifacts that were too large to display, he "acquired seventy-five acres on a rocky bluff at an old fortification (Skansen) overlooking Stockholm Harbor."[152] Skansen consisted of about 120 buildings from various parts of Scandinavia, some dating from medieval times, including cottages, barns, shops, a church, a manor house, and craftsmen's workshops. Over time, Hazelius and his successors added gardens, farm crops, animals, guides in costume, musicians and folk dancers, and period food in on-site restaurants and bars.[153] Hazelius' approach of using a historical/cultural background to place artifacts in context was new at the time, and in using this approach, he "re-created the life of older periods, stimulating the sensory perceptions of the visitors and giving them a memorable experience. As they walked about the carefully restored environment of another day, their thoughts and emotions helped bring the place to life."[154] The Buffalo Niagara Heritage Village in Amherst, New York is similar, albeit comparatively newer, having also acquired and relocated a number of historic nineteenth-century buildings to

[149]Magelsson, *Living History Museums,* xxiv; Alexander, *Museums in Motion,* 209.
[150]Old Fort Niagara, accessed October 3, 2015, http://www.oldfortniagara.org.
[151]Alexander, *Museums in Motion*, 10-11.
[152]Ibid., 84-85.
[153]Ibid.
[154]Ibid.

their 35 acres.[155] Buildings include historic homes and one-room schoolhouses, along with a working replica of a blacksmith shop. They contain a combination of original and replicated furnishings, with all reproductions based on the originals. Costumed interpreters provide demonstrations of cooking, weaving, and blacksmithing, and the museum offers a number of hands-on experiences for visitors.

Colonial Williamsburg was one of the first historical sites in America to embrace the idea of sensory perception using reconstructed scenes from the past and incorporating the senses of smell, hearing, and taste in addition to sight.[156] It was founded in 1926 with the goal of bringing "the colonial capital back to life."[157] Original buildings were combined with authentic reproductions reconstructed according to historical and archaeological evidence. The museum's educational and interpretive programming includes craftsmen at work, carriages in the streets, military drills, and period music, as well as costumed guides in character.[158] Colonial Williamsburg also has a period restaurant, with servers in period clothing. Another example of a living history museum with a focus on authenticity is Plimoth Plantation in Plymouth, Massachusetts.[159] This reconstructed Pilgrim village focuses heavily on using dialects appropriate to the time period in its first-person interpretation, while actors remain in character at all times, including in visitor interactions. The curators take great care in researching the vocabulary and outfits of the costumed interpreters to ensure that nothing after the mid-1600s appears. This is in addition to the research going into the museum grounds, on which all buildings have been reconstructed with the help of

---

[155]Buffalo Niagara Heritage Village, accessed October 3, 2015, http://bnhv.org.
[156]Griffiths, *Shivers Down Your Spine*, 251.
[157]Alexander, *Museums in Motion,* 91.
[158]Ibid.
[159] Lord and Lord, *The Manual of Museum Exhibitions,* 312; Magelsson, *Living History Museums*, 23.

archaeological evidence, and even the farm animals are chosen to resemble those kept by the Puritan settlers.

5. Exhibit Design and Technology

In the twenty-first century, technological advances have enabled many museums to replace traditional methods of presenting information with interactive and multisensory computer-based technology. This allows them to not only provide more information but also to engage visitors of varying learning styles and provide a more customized museum experience.[160] Since many science museums present a great deal of abstract content, they frequently must rely on computers as exhibit elements rather than as supplements to the exhibit content.[161] However, art, anthropology, and history exhibitions can also utilize hands-on devices and interactive computer programs.[162]

Exhibit technology can include videos, audio guides, interactive games, and hands-on learning opportunities of various kinds.[163] Use of technology such as video, audio, and simulation have the ability to "bring an exhibition to life" by putting objects on display in context, better explaining the complex ideas presented, and providing interactive opportunities.[164] Audio technology typically consists of either ambient sound or music, or audio labels. Audio labels can take the form of push buttons within the exhibit, or portable wands which provide an audio tour.[165] They may, particularly in the case of tours, provide all the information in a set order, or the order may be controlled by the visitor, in which case each individual audio label must be effective on its own.

---

[160]Locker, *Exhibition Design*, 7; George F. MacDonald, "Change and Challenge: Museums in the Information Society," in *Museums and Communities: The Politics of Public Culture,* eds. Ivan Karp, Christine Mullen Kreamer, and Steven D. Lavine (Washington and London: Smithsonian Institution Press, 1992), 163.
[161]Beverly Serrell, *Exhibit Labels: An Interpretive Approach* (Walnut Creek: AltaMira Press, 1996)*,* xiii.
[162]Lindauer, "The Critical Museum Visitor," 210.
[163]Herminia Din and Phyllis Hecht, eds., *The Digital Museum: A Think Guide* (Washington, DC: American Association of Museums, 2007)*,* 10.
[164]Lord and Lord, *The Manual of Museum Exhibitions,* 222.
[165]Serrell, *Exhibit Labels,* 177.

With the increased availability of smartphones, some museums have been able to forego the wands in favor of offering a cell phone audio tour. The use of films can also be an important tool for communicating context.[166] They are helpful in serving as a way to convey the messages in the exhibition without text that must be read, in addition to presenting contextual information.[167] The use of video projections can immerse visitors in the exhibition through the overwhelmingly sensory combination of images and sound, which, as Hughes writes, will "draw their attention to a particular theme or idea."[168]

Computers are either used alone or as a supplementary tool, and can enable visitors to choose the quantity and nature of the information presented to them. Serrell writes that "computers provide exciting possibilities to combine text, sound, photographs, animation, and video and to make interactive links between subjects."[169] The Theodore Roosevelt Inaugural Site is an example of a museum which uses a variety of interactive elements that can appeal to a wide range of visitors, incorporating touch screens and multimedia such as audio and video in addition to the displays of photographs and text labels. The touch screens are simple enough for children to use, but enjoyable for adults as well.[170]

5.1 Museum Experiences and Active Learning through Interactive and Sensory Elements

Due to the immense competition not only among museums but also between museums and other leisure attractions, successful museums must offer a range of

[166]MacDonald, "Change and Challenge: Museums in the Information Society," 169.
[167]Serrell, *Exhibit Labels,* 179.
[168]Hughes, *Exhibition Design,* 163.
[169]Serrell, *Exhibit Labels,* 180.
[170]Museum visit, October 2012.

experiences in order to meet the varied needs of different types of visitors.[171] A museum which provides a wide range of experiences and opportunities can attract a wider audience than a museum which does not, and also results in a greater number of visitors leaving the museum "stimulated, satisfied, and informed."[172] Alma Wittlin's observation in 1970 holds true today: that the importance of visual and tactile stimulation is one of the fundamental causes of the attraction of people to museum materials.[173] Museums can use this ability to provide such experiences as an advantage over competing leisure activities.

Hands-on and interactive elements enable museums to provide a greater range of experiences and learning opportunities for different types of visitors.[174] Exhibition designers can help more visitors to understand all of the exhibition content better by including the same message in a variety of elements, including text, video, and audio.[175] Visual elements and sound should be utilized in order to accommodate visitors who learn best through these kinds of stimuli and are less likely to read labels. Visual learners prefer displays which include images, film, or three-dimensional elements over written exhibit texts and labels, and are better able to understand and connect with the exhibition if elements such as these are incorporated.[176] For auditory learners, incorporating gallery talks or lectures and opportunities for discussion with the museum staff will allow them to learn from and more fully enjoy the exhibition.[177] Interactive

---

[171]Black, *The Engaging Museum: Developing Museums for Visitor Involvement*, 267.
[172]MacDonald, "Change and Challenge: Museums in the Information Society," 169.
[173]Alma Wittlin, "A Twelve Point Program for Museum Renewal," in *Reinventing the Museum: Historical and Contemporary Perspectives on the Paradigm Shift,* ed. Gail Anderson (Lanham: AltaMira Press, 2004), 46.
[174]Caulton, *Hands-on Exhibitions,* 20.
[175]Hughes, *Exhibition Design,* 163.
[176]Ibid., 42-43.
[177]Ibid.

exhibits are key for engaging kinesthetic learners, who need to be actively involved with the exhibition content in order to learn.[178] In order to hold the attention and interest of kinesthetic learners, museums should provide hands-on activities and opportunities to touch objects.[179] As traditional museum displays consisting of objects in glass cases will quickly bore a kinesthetic learner, interactive devices that make them feel actively involved in the museum are particularly important in engaging these types of visitors. Immersive theater experiences are an example of a good way to engage kinesthetic learners. The Bullock Texas State History Museum in Austin, Texas has a "4D special effects theater" called the Texas Spirit Theater, which plays several daily films about Texas history.[180] These films are accompanied by immersive special effects such as lightning, wind, rain, and shaking of the theater seats, which correspond to the story being told in each film.

Caulton predicted in 1998 that future museums would "incorporate a whole range of interpretative devices – including artefacts, hands-on exhibits, live interpreters and new technologies – to help visitors make sense of their surroundings."[181] Another term for these interpretive devices is "modalities," which Serrell defines as "the forms, or modes, of presenting information or experiences."[182] Exhibit designers should always consider the best way to tell each part of the story in order to choose the best modalities to utilize. Since interactive technology comes at no small expense and most museums do not have an unlimited budget, the use of computer programs in exhibits can only be justified in situations when they are definitely the best modality for the job and are likely

[178]Ibid.,17.
[179]Ibid., 43.
[180]Bullock Texas State History Museum, accessed October 3, 2015, http://www.thestoryoftexas.com.
[181]Caulton, *Hands-on Exhibitions,* 139.
[182]Serrell, *Exhibit Labels*, 66.

to be utilized by the majority of visitors.[183] The use of multiple modalities will allow for choices in how visitors receive the information provided, which will appeal to a greater range of visitors. Modalities that can be used in museum exhibits include written labels and brochures, photos and videos, sounds, objects which can be touched, interactive devices, illustrations and other graphic displays such as maps and diagrams, computers, and demonstrations by interpreters.[184] According to Lord, utilizing a variety of methods to communicate the exhibition subject matter allow visitors to make choices and helps get the information across to visitors with a range of abilities and learning styles.[185] This will result in increased access to exhibitions and a more satisfying visitor experience. While many of these methods are costly, museums with smaller budgets can still accomplish similar results through creativity. As discussed in Section 4, social interaction is an important element in interactive exhibits. Assigning knowledgeable museum staff and volunteers the role of engaging visitors and answering questions can in be just as effective as providing computers to give more details about the displays, and is certainly more cost-effective. Lord writes: "While many exhibition techniques utilize interactive elements, our essence as social beings means that the most satisfying of interactive experiences are social in nature."[186] Another option is for smaller museums to collaborate with other organizations to provide programming that incorporates more interactivity than the museum may have the means to provide on a more regular basis.[187]

---

[183]Ibid., 182.
[184]Ibid., 66-67.
[185]Lord and Lord, *The Manual of Museum Exhibitions,*137.
[186]Ibid., 301.
[187]Falk, *Identity and the Museum Visitor Experience,* 229; Angela T. Spinazze, "Technology's No Tea Party for Small Museums," in Din and Hecht,129.

5.2 Virtual Exhibits

Virtual experiences can also be a form of sensory experience, if they engage multiple senses. Virtual museum experiences have been spreading rapidly in recent years, and are likely to continue to become more widespread and a more vital element of museum programming as technology becomes more sophisticated throughout the twenty-first century.[188] A major benefit to creating virtual exhibits and virtual reproductions of artifacts is that museums can now provide greater public access to their collections. This is especially useful in cases where a particular object is not on display, out for conservation, or on loan to another institution.[189] Virtual exhibits, whether online tours or full-on virtual reality, are excellent for circumstances where certain artifacts are either too fragile to be on display, or are in a location that is off limits to visitors.[190] This technology is also helpful for enabling museums to provide access to environments which cannot be visited in real life, or even those which no longer exist. Lord discusses an example: the Museum of Paleontology at the University of California in Berkeley, which only has a few exhibits on the university campus but a wide variety of online-only exhibitions and programming.[191] While the disadvantage of purely virtual exhibits is "limited or no access to 'the real thing'," Lord believes that virtual museum experiences have the ability to make online visitors want to visit museums to experience related exhibits and artifacts in person.[192] The creation of elaborate virtual experiences is often not financially feasible for many museums. In the case of university museums,

---

[188]Lord, "The Purpose of Museum Exhibitions," 16; Lord and Lord, *The Manual of Museum Exhibitions,* 310.
[189]Klaus Müller, "Museums and Virtuality," in *Museums in a Digital Age,* ed. Ross Parry (New York: Routledge, 2010), 295.
[190]Ibid., 302-303.
[191]Lord and Lord, *The Manual of Museum Exhibitions,* 310.
[192]Lord, "The Purpose of Museum Exhibitions," 16.

utilizing student talent in exchange for course credit can make it more cost-effective. However, museums may be able to simply make artifacts accessible online through photographs and written descriptions, perhaps providing the option for visitors to the website to click a button to play music or sound effects which are related to the artifacts photographed. For example, an online exhibit displaying images of eighteenth century historical artifacts could play music composed during that time. While perhaps not as effective or exciting as a full-on virtual experience, this will still give online visitors a taste of what they will find in the museum.

6. Keeping the Museum Artifact-Centered

Even when exhibits do not directly involve handling artifacts, they are "designed to help visitors explore real objects or real phenomena."[193] This experience with genuine artifacts is the most important function of the museum, as it is the reason most visitors come to museums.[194] There is a great deal of potential for conflict over whether exhibitions should be artifact-centered or interaction-centered. Examples include the possibility of limited resources being taken from other museum functions such as conservation or research in favor of creating and maintaining an interactive gallery, a hands-on exhibition threatening the safety of original artifacts, and the impact an interactive display in one gallery may have on visitors' behavior or enjoyment of the exhibits in nearby galleries.[195] However, interactive galleries do not need to be expensive or disruptive. There are many ways to prevent conflict. The challenge for museums is how to put both artifacts and interactives to best use and clearly define each of their roles.[196] MacDonald believes that museums' "non-material resource collections," which can include recordings of oral histories and other audiovisual materials, replicas, and reenactments, are of equal value to the artifact collections, which he states are worth preserving "primarily for the information embodied in them."[197] He wrote in 1991 that "although artifacts remain museums' medium of specialization, a 'total media collections' approach is necessary: an acknowledgement that oral history, photographic and audiovisual materials, replicas, digital databases, re-enacted

[193]Caulton, *Hands-on Exhibitions*, 2.
[194]Black, *The Engaging Museum*, 271.
[195]Serrell, *Exhibit Labels*, 67.
[196]Caulton, *Hands-on Exhibitions*, 35.
[197]MacDonald, "Change and Challenge: Museums in the Information Society," 160.

processes, live cultural performances and staff expertise are also important information resources that need to be managed."[198] Museums can better enable visitors to understand the collections by using multiple techniques, including technology, visible storage, and live interpretation.[199]

6.1 Providing Context and Supplementary Material for Artifacts

> *"You shall always show objects in their functional position, or suggest it to some degree."*[200]

Placing artifacts in realistic and immersive settings which provide context can make displays more appealing and more effective in conveying information.[201] Research shows that displaying artifacts in context enables visitors to get more out of the exhibits.[202] Black recommends using props and backdrops to recreate the original environment as closely as museum resources will allow, whenever possible utilizing "living history" demonstrators and real or replicated objects that can be handled.[203] Museum visitors are not always familiar with the stories being told, and so the interpretation of the artifacts must aim at telling the story.[204] This is especially important in creating exhibitions when there are very few original artifacts in existence. In the case of the Buddenbrooks House in Germany, the ancestral house of Thomas Mann,

---

[198]George F. MacDonald and Stephen Alsford, "The Museum as Information Utility," in *Museums in a Digital Age,* ed. Ross Parry (New York: Routledge, 2010), 75.
[199]Caulton, *Hands-on Exhibitions,* 1.
[200]Arminta Neal, *Exhibits for the Small Museum: A Handbook* (Nashville: American Association for State and Local History, 1976), 147.
[201]Griffiths, *Shivers Down Your Spine*, 168.
[202]Black, *The Engaging Museum,* 268.
[203]Ibid., 276-278.
[204]Carrol Pursell, "Telling a Story: 'The Automobile in American Life,'" in *Ideas and Images: Developing Interpretive History Exhibits,* eds. Kenneth L. Ames, Barbara Franco, and L. Thomas Frye (Nashville: American Association for State and Local History, 1992), 236.

only a few household objects survive. In 2000, the curators used ambient noise and sounds of the nineteenth-century street to create a "framing device" for the artifacts.[205]

Sensory components are, however, typically best used to supplement collections, not replace them.[206] Interactive exhibits, rather than standing alone, should serve to supplement the artifacts and create unique learning experiences, and must always be designed to improve the visitor's understanding of the artifacts.[207] Conversely, objects cannot stand alone either and require supplemental content. This was known before the technological advances that enable museums to incorporate such a wide variety of sensory elements. In 1917, John Cotton Dana, one of the great museum innovators of the twentieth century, declared that "by no right in reason whatever is a museum a mere collection of things," holding the view that supplemental materials should "accompany, explain, and amplify the exhibits."[208] Placing the artifacts into a supporting role by no means downplays the importance of the collections. Rather, it furthers the overall goals of the museum by providing context and helping visitors to understand the history and importance of the artifacts, which will increase their interest in the topic and, ideally, keep them coming back to the museum. The objects are the heart of the experience, but sensory components can be very important to the exhibit's success since they can influence whether visitors will look at the objects and how interested they will be in the

[205]Marstine, *New Museum Theory and Practice,* 5.
[206]Simon, *The Participatory Museum,* 5.
[207]Ibid.; Caulton, *Hands-on Exhibitions,* 35.
[208]John Cotton Dana, "The Gloom of the Museum," in *Reinventing the Museum: Historical and Contemporary Perspectives on the Paradigm Shift,* ed. Gail Anderson (Lanham: AltaMira Press, 2004), 26.

exhibit.[209] While museum objects are without doubt a major attraction to most visitors, they are not the only thing attracting all visitors.[210]

6.2 Conservation Concerns and the Use of Replicas

Museums have the conflicting goals of both offering high-quality object experiences and protecting their collections, as they have to be sure that objects will not be damaged or endangered.[211] The most obvious problem that many curators and museum critics see with the adding of interactive and immersive content involves conservation concerns. As mentioned earlier, the eighteenth and nineteenth-century move away from physical interaction with artifacts coincided with increased concern for conservation.[212] Many museums still have a problem with the idea of visitors touching the collections, because of the risk and worry involved in conservation.[213] This is a perfectly reasonable concern. Griffiths, however, responds to concerns that objects might be damaged in hands-on exhibits by pointing out scientific evidence that damage can also be inflicted by coughing, sneezing, and unauthorized touching, which cannot always be controlled.[214] Candlin writes regarding hands-on exhibits that "the right of the individual to learn from and enjoy public collections is in tension with the duty of the museum to care for its objects in perpetuity."[215] She believes touch is "an important and at times irreplaceable way of understanding art objects," but acknowledges that many

[209]Falk and Dierking, *Learning from Museums*, 128.
[210]Falk, *Identity and the Museum Visitor Experience,* 25.
[211]Simon, *The Participatory Museum,* 173.
[212]Classen, "Museum Manners," 907.
[213]Kevin Hetherington, "Accountability and Disposal: Visual Impairment and the Museum," *Museum and Society* 1.2 (2003): 104.
[214]Griffiths, *Shivers Down Your Spine,*191-192.
[215]Candlin, "Don't Touch! Hands Off!" 72.

artifacts are too fragile for frequent handling.[216] However, she seems critical of museums utilizing interactive or sensory elements and designated handling material, arguing that these interpretive methods are merely a way of "containing damage" and attempting to discourage visitors from touching other artifacts. She writes: "Allowing people to touch selected objects from the collection in supervised circumstances is a way of granting access through touch without giving people choice or control over what they touch."[217] Realistically, the level of choice and control that Candlin appears to advocate is both impossible and unwise. Many objects simply cannot be touched any more than is necessary by museum collections staff as part of their jobs, and visitors can and should only be permitted to touch what is safe for them to touch. Visitors should be made aware of how the objects must be handled differently from how everyday objects are handled, as well as why certain objects cannot be handled at all. By providing such explanations, museums can increase public awareness and understanding of collections management and conservation. They may find that members of the public are interested in learning how museum staff are taught to handle objects.

At Julius Rosenwald's Museum of Science and Industry in Chicago in the 1930s, contact with actual machinery and examination of working models of machinery were the primary goals, but if original artifacts were not available, reproductions or models were provided.[218] By the middle of the twentieth century, many children's museums and science centers were using exhibition material built specifically for the purpose of

---

[216]Ibid., 75.
[217]Ibid., 72.
[218]Harold Skramstad, "An Agenda for Museums in the Twenty-first Century," in *Reinventing the Museum: Historical and Contemporary Perspectives on the Paradigm Shift,* ed. Gail Anderson (Lanham: AltaMira Press, 2004), 122-123.

demonstrating the function of the "inactive" museum objects.[219] The presence of original artifacts is vital to create a special museum experience, but museums can find an "appropriate balance" between artifacts and replicas, and create the best role for both.[220] As Alma Wittlin wrote in 1970, "Scholars need not lose the unique experience that comes from the seeing and touching of actual specimens; all that has to be done is a distribution of the hoards of duplicates…"[221] Candlin points out that some museums (history museums in particular) may have multiple versions of the same object, some of which can designated for visitor handling.[222] In addition, museums may have intentional "'living history' collections of objects – originals or replicas – that can be used in such programming."[223] For example, during a tour of the Theodore Roosevelt Inaugural Site, reproductions of telegrams and of Roosevelt's handwritten draft of his first address to the American people are passed around.[224] Müller wrote in 2002 that our knowledge of cultural history is informed by a combination of original and reproduced works, and that museums should "find ways to use both the precious original and its precious reproductions."[225] Living history museums often use audio-visual displays and replicas to exhibit important items that they might not have and to put the artifacts in context.[226] This has been a common practice for many years. Many visitors like reconstructions because they are "a more living approach to history": for some visitors, it can be hard to

[219]Gurian, "What Is the Object of This Exercise?" 272-273.
[220]MacDonald, "Change and Challenge: Museums in the Information Society," 172.
[221]Wittlin, "A Twelve Point Program for Museum Renewal," 45.
[222]Candlin, "Don't Touch! Hands Off!" 77.
[223]MacDonald, "Change and Challenge: Museums in the Information Society," 170-171.
[224]Museum visit, October 2012.
[225]Müller, "Museums and Virtuality," 300.
[226]Daugbjerg, "Playing with Fire: Struggling with 'Experience' and 'Play' in War Tourism," 20.

understand the objects in a museum where they are out of context, and said objects can sometimes be seen better in context in a reconstruction.[227]

[227]Ibid., 25.

7. Authenticity

One major strength of interactive or hands-on museums is their ability to provide authentic experiences.[228] Visitors must be able to have confidence in the authenticity of the objects or images presented in the museum. Only then can they find meaning in the exhibition.[229] In Manchester, England, Wigan Pier and the Museum of Science and Industry are examples of museums which bring the past to life through the use of reconstructions, live performances, and working models of technology, utilizing these elements in order to stimulate the visitors' imaginations and create a feeling of authenticity.[230] Gaynor Bagnall observes that the use of actors at the Pier heightened the physical stimulation of emotions and imagination, and at the Museum there was a connection between the physicality of the experience and the emotions and imagination produced.[231] Physical experiences within the museum generate an emotional response that makes visitors feel as though they are really gaining a concept of what life was like in the past, and there is an "emotional realism" that can be generated by use of performances and reconstructions that attempt to recreate the past within the museum.[232] These realistic experiences can often give visitors a better idea of history than displays and objects alone, as smells and sounds can create an emotional impact.[233] According to Bagnall, visitors identified with the emotions generated by the exhibits at the Museum and the Pier in ways that gave an authenticity to the feelings

[228]Caulton, *Hands-on Exhibitions*, 137.
[229]Lord, "The Purpose of Museum Exhibitions," 16.
[230]Gaynor Bagnall, "Performance and Performability at Heritage Sites," *Museum and Society* 1.2 (2003): 87-88.
[231]Ibid.
[232]Ibid., 89.
[233]Ibid., 90.

activated by the two sites. In particular, the use of actors to recreate the past at the Pier was important in stimulating the emotions and imagination of the visitors.[234]

According to Magelsson, living history museums claim "to be real history by virtue of their attention to detail… Not only do these places offer total, three-dimensional environments in which the visitor can encounter costumed personas from past eras in history, but the experience is heightened – made more real – by the curatorial machinery of the museum… Thus, living history museums do not merely represent the past; they make historical 'truth' for the visitor."[235] This is debatable, as there is always a question of whose history is represented within the museum. Living museums such as Colonial Williamsburg in Virginia and Skansen in Sweden often seem like "authentic" restorations or reconstructions of life in the past to many people.[236] These recreated environments can "offer a temporary escape from reality" that enables visitors to suspend their disbelief and immerse themselves in the history.[237] Curators can further encourage this suspension of disbelief by using archaeological evidence and period documents to prove the accuracy of their recreations.[238] However, one must keep in mind that while the information presented may be accurate, it does not always contain the complete story.

7.1 Should Museums Try to Recreate the Sensory Experiences of the Past?

> *"… should the historian of smell or sound try to actually recreate or experience the odors and noises of the past? Is it actually possible to do so and, if so, is it also desirable? In short, can we really smell*

[234]Ibid., 89.
[235]Magelsson, *Living History Museums*, xii.
[236]Marstine, *New Museum Theory and Practice*, 3.
[237]Locker, *Exhibition Design*, 33.
[238]Magelsson, *Living History Museums,* 89.

> *and hear (let alone touch, taste, and see) the past or are we more limited in what we can achieve?"*[239]

Many scholars and teachers argue in favor of sensory experiences in museums and praise reconstructions and attempts to replicate sensations of the past in "living museums" such as Colonial Williamsburg, saying that they are important in showing how people lived and a great way to teach a class because "you can smell the history."[240] Hoffer believes that recreations and reenactments of the past can "close the gap between then and now" in a way that other history museums cannot.[241] Hoffer asks the question of, if historians can recreate the sensory world of their ancestors, whether they can then convey it to others.[242] He believes in the importance of imagination in historical reconstruction, stating that sensory history allows us to "stimulate our powers of imagination to their fullest extent," and can assist us in fulfilling "the highest purpose of historical scholarship: to make the past live again."[243] To prove that this is desirable, he points out the numerous historic site museums and reenactments throughout the United States which are dedicated to bringing the past to life for visitors, stating that "the re-creations and the re-enactments, the interpreters and the travels to historical sites do enable us to sense a little more of the world we have lost."[244]

It appears that while Smith believes in the importance of the other senses in historical research, he does not advocate the use of them in teaching the public about history. His primary objection to sensory recreation is that while we can sometimes

---

[239]Smith, "Making Sense of Social History," 178.
[240]Smith, *Sensing the Past,* 120-121.
[241]Ibid., 119.
[242]Hoffer, *Sensory Worlds in Early America,* 14.
[243]Ibid., 15, 253.
[244]Ibid., 8, 13.

recreate the sounds, tastes and smells of the past, it is impossible to experience those sensations the same way those people did back then because we live in a different world with changed perceptions of the senses.[245] In other words, the context is impossible to replicate, and so while certain sounds, smells, and tastes can be reproduced in some way, sensory recreation cannot truly help us to understand how the people of a given time and place understood their world. In addition, Smith questions whether it really is possible to recreate the sounds of Williamsburg or the Civil War with the presence of planes overhead, nearby traffic, and other background noises of modern times. He believes that since the conditions present in the past cannot be reproduced, neither can the experience; while it may be possible to reproduce sounds and smells of the past the way we understand those sounds and smells, doing so cannot help us understand how these same sensations were previously understood.[246]

Smith believes we should rely on print to understand senses in the past, arguing that we should do so because the reason historians know about smells in history is that "most written descriptions of smells from the past tell us what smells smelled like."[247] However, Smith dismisses too quickly the benefits of attempting to recreate the sensory experiences of the past. While it is true that in most cases we cannot recreate the conditions, sensory recreation in museum exhibits can supplement the objects and information provided and better enable visitors to gain some understanding of the past. It adds depth and texture to the past in a way that text and artifacts alone do not.

---

[245]Smith, *Sensing the Past,* 120-121.
[246]Ibid., 121-122.
[247]Smith, "Producing Sense," 849.

7.2 Critique of Interactive and Multisensory Elements in Museums

A common concern regarding multisensory museum experiences is that while museum visitors appear to enjoy the interactive parts of the exhibits, these elements may not actually further the educational goals of the museum. Curators since the early twentieth century have worried about exhibits being transformed by immersive and interactive elements into shows rather than educational experiences.[248] For example, Griffiths points out that "while Discovery Rooms break down traditional boundaries between visitor and artifact, they don't necessarily challenge the discursive underpinnings of why these objects are even in a museum and what it might mean to view them out of context."[249] Also, video-based studies in the UK and Europe concluded that despite the success of interactive elements, there was no significant evidence to suggest that the visitors connected the activities to the original objects.[250]

Upon entering a living history exhibit, visitors are "encouraged to believe that they are entering an accurate, authentic representation of the past."[251] However, Magelsson acknowledges that in some cases, "the irreconcilability of a period environment with the presence of modern-day tourist bodies may simply be too big an obstacle for willing suspension of disbelief."[252] The term "living history" can be misleading, Magelsson writes, in its implications "that other forms of history are 'dead'" and "that one can bring history back to life by way of performance." [253] At many living

[248]Griffiths, *Shivers Down Your Spine*, 162.
[249]Ibid., 201.
[250]Ibid., 193; Christian Heath and Dirk vom Lehn, "Interactivity and Collaboration: New Forms of Participation in Museums, Galleries and Science Centres," in *Museums in a Digital Age,* ed. Ross Parry (New York: Routledge, 2010), 271.
[251]Magelsson, *Living History Museums,* 22.
[252]Ibid., 16.
[253]Ibid., xx-xxi.

history museums that employ costumed interpreters, the interpretation is entirely first-person to the point where the interpreters refuse to acknowledge "any time after the established day of their interpretation" and will not accept the premise that "the visitors asking them questions are from the 'future.'"[254] Potter argues that this practice leaves visitors without answers to many of their questions, relegating them to a purely passive role.[255] First-person interpretation is sometimes criticized in this way because it "limits the learning to a small period of history and prevents making connections with the present."[256] There are ways to avoid this problem. At some museums, the costumed interpreters transition into third person when asked questions that they "cannot answer without breaking character and speaking in a present-day voice." At others, the interpreters will use what is called the "my time-your time" technique, which allows them to avoid getting out of character while giving the visitor their answer.[257] Unlike first-person programming, third-person programming allows the interpreter to make comparisons between the time they are portraying and today, which enables them to better answer visitors' questions. Although they may be viewed as less authentic, this technique provides a more effective teaching opportunity.[258]

The best exhibition designers successfully incorporate "all media appropriate to their subject."[259] While it may be tempting to utilize interactive or hands-on elements in every exhibit, designers must keep in mind that there may be situations where

---

[254]Ibid., xxii.
[255]Parker B. Potter, Jr. and Mark P. Leone, "Establishing the Roots of Historical Consciousness in Modern Annapolis, Maryland," in *Museums and Communities: The Politics of Public Culture,* eds. Ivan Karp, Christine Mullen Kreamer, and Steven D. Lavine (Washington and London: Smithsonian Institution Press, 1992), 479.
[256]Magelsson, *Living History Museums,* xxiii.
[257]Ibid.*,* xxiii.
[258]Ibid.*,* 16-17.
[259]Ames, Franco, and Frye, *Ideas and Images,* 319.

interactives are not necessary.[260] Each element used must support the exhibit objectives and relate appropriately to the other exhibit elements.[261] Mayrand warns against being tempted by new and exciting media or interactive devices, advising that each one used in the exhibit should be justified by the content of the exhibit: "The end justifies the means, not the other way around."[262] Witchey expresses concern over how quickly new technologies are being incorporated into museums, worrying that the speed of this technological advancement does not allow time to consider how it will "change the culture of museums," or for education as to what tools to use and how to use them.[263]

During the nineteenth century, museums began to experiment with "culture history arrangement," arranging exhibits as "habitat groups" in natural history museums and "period rooms" in art or history museums.[264] While these arrangements did provide context for the artifacts, they used a great deal of space and their configuration did not allow visitors any opportunity to closely inspect individual pieces.[265] According to Lord, these static displays were "at best a minimal instance of the 'exhibition' function."[266] The New England Habitats exhibit at the Boston Museum of Science attempts to supplement its habitat group displays with an interactive device through which visitors can smell recreations of various locations across New England. Each display is a landscape recreation containing animal replicas and plants depicting each environment.

---

[260]Caulton, *Hands-on Exhibitions*, 29, 35.
[261]Serrell, *Exhibit Labels*, 5.
[262]Mayrand, "The Role of the Exhibition Designer," 419.
[263]Holly Witchey, "New Technologies, Old Dilemmas: Ethics and the Museum Professional," in *The Digital Museum: A Think Guide,* eds. Herminia Din and Phyllis Hecht (Washington, DC: American Association of Museums, 2007), 191.
[264]Alexander, *Museums in Motion*, 10.
[265]Ibid., 186.
[266]Lord, "The Purpose of Museum Exhibitions," 13.

While a good idea in theory, the smell option in this exhibit is poorly done. There are no labels indicating what scents (whether plant, animal, or other smells) are meant to be detected in each display, and they all smell quite similar, to the point where one cannot distinguish between the scents of the Maine coast and those of the Green Mountains of Vermont.[267] Serrell recommends including clear instruction labels for interactives.[268] There are visitors who may not wish to use interactive devices, or at least do not want to need to use them in order to understand the theme of the exhibition. Therefore, it should not be necessary: the interactives should be labeled appropriately so that their purpose may be understood whether visitors choose to use them or not.[269]

Exhibition designers must consider all factors in the exhibition space before choosing which modalities to utilize. The use of sound in galleries with poor acoustics can be disastrous, not to mention counterproductive.[270] There are ways around this, however. At the Harvard Museum of Natural History, a display on patterns in nature entitled “The Zebra’s Stripes” provides a listening device consisting of two headsets attached to the display, which visitors can pick up if they wish to listen to an audio track about how the purpose of the zebra’s stripes.[271] (Figure 4) This prevents any potential issues stemming from the acoustics of the gallery.

[267]Museum visit, August 2013.
[268]Serrell, *Exhibit Labels,* 233-234.
[269]Ibid., 57.
[270]Mayrand, “The Role of the Exhibition Designer,” 411.
[271]Museum visit, August 2013.

Figure 4
Photograph by Naomi Reden, courtesy of Harvard Museum of Natural History

Caulton writes that successful interactive exhibits must function at multiple levels to meet the needs of "visitors of different ages and abilities."[272] The "essential exhibit message" should not be limited to only one exhibit element, as it will not reach visitors who do not utilize that particular element.[273] According to Serrell, museums should provide all information content and experiences in multiple ways so that visitors can select the portions of the exhibit they prefer and still learn and enjoy the experience.[274] It is, however, a bad idea to try to accommodate every possible learning style, difference, interest and experience level, as too many ideas in the exhibition will be

[272]Caulton, *Hands-on Exhibitions*, 2.
[273]Serrell, *Exhibit Labels,* 59.
[274]Ibid.*,* 61.

overwhelming.[275] While designers agree that it is good to provide options, providing too many options can be detrimental. Serrell recommends providing a small range of exhibit elements which are all interesting and relevant, so that visitors can spend time enjoying what appeals to them in the exhibit rather than trying to decide among a too-large number of elements.[276] "Media overload" is a concern.[277] Such sensory overload will prevent visitors from enjoying and learning from the exhibits.

An example of a well-done multisensory experience was presented by the Peabody Museum of Archaeology & Ethnology at Harvard University as part of their 2013 summer family programming. The museum presented a one-day program entitled "Chocolate Treasure," during which museum interpreters taught visitors the history of cacao and chocolate. The verbal explanation of the topic included a brief introduction to Mayan history and culture and was supplemented with drawings and maps, as well as various interactive activities. There was a hands-on craft activity in which children (the exhibition was geared towards ages seven and up) were able to decorate a paper Mayan shield, and several other sensory elements. The smell of chocolate drew visitors into the room from the nearby areas of the museum. Cacao pods and beans were available for visitors to see and touch. There were samples of cacao bits which the interpreters encouraged visitors to taste, and a hot chocolate drink, made in the Maya way with traditional spices and no sugar, was available to taste as well. The interpreters then asked visitors how this drink compared with our hot chocolate drink of

[275]Ibid., 75.
[276]Ibid., 43.
[277]Black, *The Engaging Museum,* 201.

today, adding a social interaction component into the experience.[278] In this way, the museum enabled visitors to connect to the past through a common experience.

The Peabody Museum and other museums have successfully incorporated multisensory experiences, but there is still progress to be made. In many museums, the majority of interactive elements appear to be intended for specific groups. The reintroduction of touch into the museum has been most frequently aimed at children and visually impaired visitors.[279] However, "all of us, blind or otherwise, experience and understand the world through touch," and therefore many museum professionals need to change their way of thinking when implementing touch-based practices.[280] According to Griffiths, children's desire to interact with objects is a reason for the popularity of discovery rooms and hands-on centers in museums.[281] However, Caulton cites a report on museum education which stated that "Adults as much as children need a gallery environment that allows open and exploratory learning and encourages them to question and challenge."[282] Some museums fail to acknowledge this realization that adults as well as children may have a desire to handle museum objects. Classen observed in 2005 that despite the progress made in reintroducing touch into the museum, the children's museum was the only museum that offers it consistently, going along with "the common nineteenth-century association of touch with non-rational or infantile behavior."[283] The fact that most discovery rooms are geared towards children echoes the nineteenth century world view that "civilized adults" are supposed to

[278]Museum visit, August 2013.
[279]Hetherington, "Accountability and Disposal," 104.
[280]Candlin, "Don't Touch! Hands Off!" 73.
[281]Griffiths, *Shivers Down Your Spine*, 180.
[282]Caulton, *Hands-on Exhibitions*, 38.
[283]Classen, "Touch in the Museum," 284.

understand the world through sight and hearing alone and restrain their impulses.[284] Museum visitors of all ages “expect to be actively involved with the exhibits, to learn informally and to be entertained simultaneously.”[285]

[284]Classen, “Museum Manners,” 907.
[285]Caulton, *Hands-on Exhibitions,* 1.

8. Conclusion

According to Smith, while it is possible to reproduce music, certain sounds, or even smells from the past, it is not possible for people today to understand or experience those sounds or smells the same way as people in the past: the meanings of the sensations have changed.[286] He believes that the senses can only be understood in their specific social and historical contexts and shuns the idea of attempting to recreate sensory experiences, making sarcastic references to "lickable text" and "scratch-and-sniff pages."[287] However, Smith gives museum visitors too little credit. Most people understand that historic reproductions are just that: reproductions. Museums strive to make these types of experiences as authentic as is reasonably possible, and for educational purposes, approximating the sensory experiences of history can be quite effective. Hoffer writes, "The museum and the archive may house the evidence of the past, but it is up to the historians and the readers of history to breathe sensuous life into the sources."[288] The museum itself can give life to the past through the use of multisensory elements in addition to artifacts and research.

Although some sensory information cannot be duplicated, keeping in mind the concept of synesthesia – a heightened sensory awareness that takes place when certain individuals are able to experience information derived from one sense accompanied by a perception in another – can be of great use in creating museum

[286]Smith, "Producing Sense," 841, 846.
[287]Ibid., 848; Smith, *Sensing the Past,* 3.
[288]Hoffer, *Sensory Worlds in Early America,* 253.

experiences.[289] While only certain individuals are known to experience this form of sensory awareness in the true sense, museums would do well to strive for something similar. The senses that are more difficult to use in a regular museum can be accessed by engaging other senses. According to Serrell, print can engage not only sight but also hearing, in the form of visitors either reading silently to themselves or hearing someone else read aloud.[290] When it is not possible – due to budget or other constraints – to actually incorporate smells, sounds, or tastes, descriptions (in wall texts or by tour guides) of sensory information can serve the same purpose. The use of texture in gallery floors and seats and in display panels can also generate a similar response to actual physical contact.[291] Black suggests that smells relating to the exhibit can be gotten at both through including smells and through imagination, for example, "discovering that travelers to mid-nineteenth century towns in England could smell them before seeing them – no sewage removal systems."[292]

Museums can also utilize replicas to enhance the collection experience by using them to contextualize and demonstrate the function of the authentic objects, and their use does not downplay the authenticity of the artifacts. MacDonald responded to the allegations of critics that his museum was full of "simulations" by stating that the intent was "not to deceive, but to create a more intimate and more powerful experience that leaves a greater impression on the viewer's memory."[293] He points out that while the term "simulation" has connotations of imitation or fakery; the word actually comes from the Latin word meaning "similar," and goes on to declare: "What our critics fail to

---

[289]Griffiths, *Shivers Down Your Spine*, 251.
[290]Serrell, *Exhibit Labels*, 12.
[291]Griffiths, *Shivers Down Your Spine,* 180; Mayrand, "The Role of the Exhibition Designer," 411.
[292]Black, *The Engaging Museum,* 204.
[293]MacDonald, "Change and Challenge," 171-172.

remember is that all knowledge of the past is a reconstruction, tying together isolated hard facts by the use of hypothesis. What is this if not simulation?"[294]

When used appropriately, multimedia is effective in assisting visitors to connect with the exhibits and the exhibition theme.[295] With the use of replicas and modern conservation technology, museums ought to be able to find ways to increase visitor access while still protecting the collections as much as possible. Despite some dissent among historians and curators, overall, immersion and interactivity in the museum can be quite influential and a great tool for learning. By considering the importance of context and the impact that a physical or emotional experience can have, we can, through effective design tools, create artifact-centered exhibits that both engage visitors through multisensory experiences and further the goals of the museum.

[294]Ibid.
[295]Lord and Lord, *The Manual of Museum Exhibitions,* 222.

References

Alexander, Edward P. *Museums in Motion: An Introduction to the History and Functions of Museums*. Nashville, TN: American Association for State and Local History, 1979.

Ames, Kenneth L., Barbara Franco, and L. Thomas Frye, eds. *Ideas and Images: Developing Interpretive History Exhibits.* Nashville, TN: American Association for State and Local History, 1992.

Ames, Michael M. “Museums in the Age of Deconstruction.” In Anderson, 80-98.

Anderson, Gail, ed. *Reinventing the Museum: Historical and Contemporary Perspectives on the Paradigm Shift.* Lanham, MD: AltaMira Press, 2004.

Bagnall, Gaynor. “Performance and Performability at Heritage Sites.” *Museum and Society* 1.2 (2003): 87-103.

Black, Graham. *The Engaging Museum: Developing Museums for Visitor Involvement.* New York: Routledge, 2005.

Bruce, Chris. “Spectacle and Democracy: Experience Music Project as a Post-Museum.” In Marstine, 129-51.

Buffalo Niagara Heritage Village. Accessed October 3, 2015. http://bnhv.org.

Bullock Texas State History Museum. Accessed October 3, 2015. http://www.thestoryoftexas.com.

Candlin, Fiona. “Don’t Touch! Hands Off! Art, Blindness and the Conservation of Expertise.” *Body & Society* 10.1 (2004): 71-90.

Caulton, Tim. *Hands-on Exhibitions: Managing Interactive Museums and Science Centres.* London and New York: Routledge, 1998.

Chatterjee, Helen, Sonjel Vreeland and Guy Noble. “Museopathy: Exploring the Healing Potential of Handling Museum Objects.” *Museum and Society* 7.3 (2009): 164-77.

Classen, Constance. "Museum Manners: The Sensory Life of the Early Museum." *Journal of Social History* Summer 2007: 895-914.

Classen, Constance. “Other Ways to Wisdom: Learning through the Senses across Cultures.” *International Review of Education / Internationale Zeitschrift für Erziehungswissenschaft / Revue Internationale de l’Education* Vol. 45 No. 3/4

(1999): 269-280.

Classen, Constance. “Touch in the Museum.” In *The Book of Touch*, edited by Constance Classen, 275-286. Oxford and New York: Berg, 2005.

Daugbjerg, Mads. “Playing with Fire: Struggling with ‘Experience’ and ‘Play’ in War Tourism.” *Museum and Society* 9.1 (2011): 17-33.

Dana, John Cotton. “The Gloom of the Museum.” In Anderson, 13-29.

Din, Herminia and Phyllis Hecht, eds. *The Digital Museum: A Think Guide.* Washington, DC: American Association of Museums, 2007.

Falk, John H. *Identity and the Museum Visitor Experience*. Walnut Creek, CA: Left Coast Press Inc., 2009.

Falk, John H. and Lynn D. Dierking. *Learning from Museums: Visitor Experiences and the Making of Meaning.* Lanham, MD: AltaMira Press, 2000.

Food Management. “Museum cafe more than just a place to eat: authentic cuisine, food facts contribute to new American Indian Museum's educational mission.” *Food Management* (2004): 8.

Griffiths, Alison. *Shivers Down Your Spine: Cinema, Museums, and the Immersive View.* New York: Columbia University Press, 2008.

Gurian, Elaine Heumann. “What Is the Object of This Exercise? A Meandering Exploration of the Many Meanings of Objects in Museums.” In Anderson, 269-83.

Heath, Christian and Dirk vom Lehn. “Interactivity and Collaboration: New Forms of Participation in Museums, Galleries and Science Centres.” In Parry, 266-280.

Hetherington, Kevin. “Accountability and Disposal: Visual Impairment and the Museum.” *Museum and Society* 1.2 (2003): 104-15.

Hoffer, Peter Charles. *Sensory Worlds in Early America.* Baltimore, MD: The Johns Hopkins University Press, 2003.

Hughes, Philip. *Exhibition Design*. London: Laurence King Publishing Ltd., 2010.

Hutchison, Mary and Lea Collins. “Translations: Experiments in Dialogic Representation of Cultural Diversity in Three Museum Sound Installations.” *Museum and Society* 7.2 (2009): 92-109.

Karp, Ivan, Christine Mullen Kreamer, and Steven D. Lavine, eds. *Museums and*

Communities: The Politics of Public Culture. Washington and London: Smithsonian Institution Press, 1992.

Kotler, Neil and Philip Kotler. “Can Museums Be All Things to All People? Missions, Goals, and Marketing's Role.” In Anderson, 167-86.

Lindauer, Margaret. “The Critical Museum Visitor.” In Marstine, 203-25.

Locker, Pam. *Basics Interior Design 02: Exhibition Design.* Switzerland: AVA Publishing SA, 2011.

Lord, Barry. “The Purpose of Museum Exhibitions.” In Lord and Lord, 11-26.

Lord, Barry and Gail Dexter Lord, eds. *The Manual of Museum Exhibitions.* Walnut Creek, CA: AltaMira Press, 2001.

MacDonald, George F. “Change and Challenge: Museums in the Information Society.” In Karp, Kreamer, and Lavine, 158-181.

MacDonald, George F. and Stephen Alsford. “The Museum as Information Utility.” In Parry, 72-79.

Magelsson, Scott. *Living History Museums: Undoing History through Performance*. Lanham, MD: The Scarecrow Press, Inc., 2007.

Marstine, Janet, ed. *New Museum Theory and Practice: An Introduction.* Malden, MA: Blackwell Publishing, 2006.

Mayrand, Yves. “The Role of the Exhibition Designer.” In Lord and Lord, 405-424.

Mouw, Michael and Daniel Spock. “Immersive Media: Creating Theatrical Storytelling Experiences.” In Din and Hecht, 45-56.

Müller, Klaus. “Museums and Virtuality.” In Parry, 295-305.

Neal, Arminta. *Exhibits for the Small Museum: A Handbook.* Nashville, TN: American Association for State and Local History, 1976.

Old Fort Niagara. Accessed October 3, 2015. http://www.oldfortniagara.org.

Parry, Ross, ed. *Museums in a Digital Age.* New York: Routledge, 2010.

Potter, Parker B., Jr. and Mark P. Leone. “Establishing the Roots of Historical Consciousness in Modern Annapolis, Maryland.” In Karp, Kreamer, and Lavine, 476-505.

Pursell, Carrol. “Telling a Story: ‘The Automobile in American Life.’” In Ames, Franco, and Frye, 233-252.

Serrell, Beverly. *Exhibit Labels: An Interpretive Approach*. Walnut Creek, CA: AltaMira Press, 1996.

Shelley, Alexandra. "Budapest's Museums of Everyday Life." New York Times 23 October 1994: 26.

Simon, Nina. *The Participatory Museum.* Santa Cruz, CA: Museum 2.0, 2010.

Simpson, Moira G. “Revealing and Concealing: Museums, Objects, and the Transmission of Knowledge in Aboriginal Australia.” In Marstine, 152-77.

Skramstad, Harold. “An Agenda for Museums in the Twenty-first Century.” In Anderson, 118-32.

Smith, Mark M. “Making Sense of Social History.” *Journal of Social History* 37.1 (2003): 165-186.

Smith, Mark M. “Producing Sense, Consuming Sense, Making Sense: Perils and Prospects for Sensory History.” *Journal of Social History* 40.4 (2007): 841-858.

Smith, Mark M. *Sensing the Past: Seeing, Hearing, Smelling, Tasting, and Touching in History*. Berkeley and Los Angeles: University of California Press, 2007.

Spinazze, Angela T. “Technology’s No Tea Party for Small Museums.” In Din and Hecht, 121-134.

Waskul, Dennis D., Phillip Vannini, and Janelle Wilson. “The Aroma of Recollection: Olfaction, Nostalgia, and the Shaping of the Sensuous Self.” *Senses and Society* 4.1 (2009): 5-22.

Witchey, Holly. “New Technologies, Old Dilemmas: Ethics and the Museum Professional.” In Din and Hecht, 189-196.

Wittlin, Alma. “A Twelve Point Program for Museum Renewal.” In Anderson, 44-60.