Learning and Listening in Natural History Exhibits

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Introduction

With few exceptions, exhibiting natural history in museums, zoos, and aquariums is a visual affair (Dewey Platt, 1998a). Indeed, most zoo habitat designers dedicate their efforts to creating1andscapes (Coe, 1985) to depict natural environments. Yet very few, if any, living creatures (including humankind) live in habitats devoid of sound. So why, then, do these so-called "immersion" exhibits in zoos and aquariums continue. to be regarded as creative simulations of real-world environments? In this article, we hope to articulate why current zoo practice limits true understanding of natural environments' and suggest ways in which .these limitations can be addressed.

Applying Bioacoustics in Zoo Practice

The fields of bioacoustics and acoustic ecology are far from obscure among zoo professionals; in fact, an understanding of animal vocalization is frequently used in zoos and research centers as a method of determining reproductive state, emotional state, arid sex, particularly in birds without sexual dimorphism (Volodina and Volodin, 1999). In New York, Moscow, and Stuttgart, to give just a few examples, zoos are applying what they know about animal calls to determine optimum conditions for reproduction (Gibbons and Lockwood, 1985; Aich et al, 1987). According to Volodina and Volodin (1999), understanding why, when, and how animals vocalize increases the options available for non-invasive monitoring of captive populations. Zoo breeders widely acknowledge the importance of sound in the social milieu of animal environments, yet this recognition has yet to be reflected in the typical zoo exhibit. In fact, the types of human-induced sound most commonly experienced by captive animals and visitors is undiscriminated and non-correlated noise while otherwise profoundly quiet in terms of beneficial soundscapes. Hence, soundscapes that may reduce the pathological effects of captive behavior and engage the visitor by establishing a sense of place are mostly non-existent, resulting in an experientially defective environment.

In all likelihood," the reason for the silent zoo exhibit relates partly to the fact that most exhibit designers are former architects and landscape designers. As a result, the land-based "built" environment is expressed, and the multidimensional "heard" component, the soundscape, is all but forgotten. Another part of. the equation involves the animals themselves. Because vocalizing behavior among animals is, for the most part, socially motivated (Hart, 1996), the largely asocial lives of captive animals obviates the need for them to communicate. Moreover, in addition to the limited opportunities zoo exhibits present for social interaction, many animals become bored and, without specially designed forms of stimulation, exhibit inappropriate perseveration behaviors (Markowitz, 1982). And finally, part of the reason lies in the fact that many zoo exhibits are openly exposed to the distractions of noisy urban environments. However, even where exhibits are located in enclosed spaces, the basic problem remains.

Real-World Sound

As a component of any environment, the soundscape is the aural equivalent of a landscape (Schafer, 1977). In a real-world wildlife biome, the territories that animals defend are not only land-based but sound-based as well (Krause, 1992). Because humans in Western culture have evolved into a species that is dependent largely on visual cues, we have lost touch with the sonic environment; this phenomenon is best understood by acknowledging the rapid increase in the levels of noise in our cities, masking the natural soundscape (Schafer, 1977). Other animals have evolved in divergent ways, and for some species, particularly birds and marine mammals, the quality of the aural environment is critical to their survival. Krause (1992) observed that animal species survive better if their voices are not masked. A creature whose voice is masked is no longer heard by others of its kind and is therefore unable to successfully compete for mates or defend territories. In fact, the integrity of the soundscape for many species is as important as the health of the landscape, yet most zoo exhibits that aim to educate visitors about natural history make no attempt whatsoever to reveal the significance of the soundscape in natural environments. Furthermore, of the few sites that offer well-delivered sound, only one currently makes an attempt to identify what is being heard for the visitor.

At Ocean.rio de Lisboa in Lisbon, Portugal, we designed a programmed soundscape as part of the presentation (Dewey Platt, 1998b). When visitors enter the various simulated coastal habitats, which center around the theme of "One Ocean," they hear the kinds of sounds they might hear in the real-world habitat: coastal and pelagic animals from the Atlantic, Pacific, Indian, and Southern Oceans. We believe that the inclusion of sound adds to the educational value of the visual exhibit and to the richness of the overall experience, provided it is correlated to descriptive material of the audio. Indeed, in light of the knowledge that has been gained about acoustic ecology and the role that sound plays in natural environments, we believe any natural history exhibit designed today which excludes a sound component or which contains loops or unassociated audio material must be deemed significantly incomplete. .

Natural History Exhibits as Learning Environments

Since substantive research on the impact of programmed sound on live animals in zoo exhibits is currently nonexistent (given that the use of programmed sound in zoo habitats is not widespread), how captive animals react to it is largely unknown. Indeed, although taped recordings of conspecific calls can be used to stimulate reproductive behavior and decrease aggression in some animals (Tichonoff et al., 1988), transmission of pre-recorded animal vocalization should be handled with great care, since animals' reactions to them are unpredictable (Volodina and Volodin, 1999). Anecdotal evidence strongly suggests that inappropriate sound or a delivery system with mismatched components introduced in live exhibits may lead to increased levels of stress behavior in resident animals, while the opposite is indicated if the elements are correctly calibrated. When all of the exhibit components are in balance, the experience for the visitor is greatly improved. In terms of learning, visitors retain more information about a particular exhibit when the presentation is multimodal (Borun and Massey, 1994), so the fact that visitors find audiovisual exhibits more intriguing is no surprise. Indeed, many exhibits in natural history museums provide visual, audio, and tactile opportunities to their visitors and have

been doing .so for decades (Wonders, 1989). Natural history museums do a better job than zoos of educating visitors, especially children, about ecology and, perhaps more importantly, about what an "animal" is and what it is not (Bell, 1981; Bell and. Barker, 1982). Zoos, where controlled environments allow, would do well to follow the model of the natural history museum by using multimedia in creative ways to educate visitors about wildlife (Tunnicliffe, 1996). Indeed, the value of multimedia as an educational tool is now being embraced by zoo directors (Robinson, 1997). However, along with incorporating the new technologies, zoos should be prepared to discard methods now proven to be ineffective, such as redundant and push-a-button systems.

Conclusion

As learning institutions, zoos would be wise to study the educational merits of non-living exhibits in natural history museums and their creative use of multimedia, especially sound. Moreover, because zoos and aquariums house live animals, effects of programmed sound on the animals' well-being should also be studied.

Equally important is the need for more research on how programmed soundscape influences the visitor experience, particularly from an educational standpoint. If zoos wish to be true to their mission of education, they can no longer disregard the soundscape, for it is an essential component of the real-world habitats that zoos portray.

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As a museum exhibit developer, designer, and writer, Lauren Dewey Platt has contributed her talents to natural history exhibits in museums and aquariums around the world, including the Osaka Aquarium, the Tennessee Aquarium, the Kuwait Science Center, and the Qcean.rio de Lisboa, which opened ,as the centerpiece of the 1998 World's Fair. She recently received her Ph.D. in Museum Studies from The Union Institute in Cincinnati and is currently the Executive Director of the Scholars in Clinical Science Program at Harvard Medical School, where she previously conducted primate studies. She lives in Boston, Massachusetts.

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For the past quarter century, Dr. Krause has traveled the world over capturing sounds of creatures and environments large and small. He has worked at the research sites of Jane Goodall (Tanzania), Birute Galdikas (Borneo), and Dian Fossey (Rwanda), recording and evaluating the effects of ambient sound on the vocalization of the great apes. He was Scientific Director of the operation that rescued Humphrey the humpback whale from the Sacramento Delta (1985/1989) using processed feeding sounds of the same species to lure him to the ocean. Aside from his work in bioacoustics, Dr. Krause also has a background in music, having replaced Pete Seeger in The Weavers {1963), introduced the synthesizer to the fields of pop music and film, and contributed performances to over 135 major feature films and over 250 recordings. Through his company, Wild Sanctuary (www.wildsanctuary.com), he has recorded over 50 environmental record albums, creates interactive environmental sound sculptures for museums, zoos, aquariums -and other public spaces, and is a multimedia consultant for public space designers. His latest book is titled "*Into A Wild Sanctuary: A Life in Music and Natural Sound*" (Heyday Press, 1998). He lives in California.