University of Pennsylvania

From the Selected Works of David Grazian

Fall 2012

Where the Wild Things Aren't: Exhibiting Nature in American Zoos

David Grazian, *University of Pennsylvania*

Available at: https://works.bepress.com/david_grazian/4/

WHERE THE WILD THINGS AREN'T: Exhibiting Nature in American Zoos

David Grazian*

University of Pennsylvania

In this article I explore the problems and tensions inherent in staging naturalistic zoo exhibits. Exhibit staging requires zoos to negotiate among a variety of competing aesthetic and organizational demands, including the cultural expectations of audiences, the educational mission of zoos, and the practicalities of managing live animal species. The negotiation of these demands gives rise to a particular set of strategies of impression management in zoos that I call *nature making*. I discuss a number of dilemmas encountered when creating naturalistic zoo exhibits, as well as three specific strategies of nature making: the *spatial* control of sight lines; the *simulation* of nature through plant simulators, synthetic materials, and live animal handling practices; and the *censorship* of certain animal behaviors and husbandry practices from public view. These strategic practices guide how zoos perform the craft of nature making as both expressive and utilitarian work.

INTRODUCTION

Although the natural world envelops every moment of human existence, we ultimately make sense of nature through the cultural lenses that shape our various understandings of it. To this end, zoological gardens, aquariums, natural history museums, planetariums, and similarly themed attractions in the contemporary entertainment landscape employ interpretive exhibits, live demonstrations, and narrative media to furnish seemingly authentic and realistic depictions of the natural environment. In doing so, such institutions fuse together modern science with the art of storytelling and the aesthetics of visual imagination, which is how paleontologists create colorful and seemingly lifelike models of dinosaurs no human has ever actually seen (Mitchell 1998). As the biologist Edward O. Wilson (1984:51) observes, "The role of science, like that of art, is to blend exact imagery with more distant meaning, the parts we already understand with those given as new into larger patterns that are coherent enough to be acceptable as truth."

As both repositories of scientific knowledge and spectacles of mass entertainment—as bastions of both nature *and* culture—American zoos are hybrid culture-producing organizations with multiple goals designed to appeal to a variety of constituencies and institutional logics. In particular, zoos serve as providers of animal care, promoters and funders of zoological research and endangered species conservation, and purveyors of both public amusement and scientific education. While scholars

*Direct all correspondence to David Grazian, Sociology Department, University of Pennsylvania, 3718 Locust Walk, Philadelphia, PA 19104-6299; e-mail: dgrazian@soc.upenn.edu

have observed the increased popularity of theme parks, science museums, and other eclectic attractions that been alternatively called worlds of "infotainment," "edutainment," or "learning-oriented entertainment experiences" (Hannigan 1998:98; Falk and Dierking 2000:73), few have attempted to analyze exactly how their competing (and at times contradictory) organizational missions are actually negotiated and managed on a day-to-day basis by the creators of such cultural productions.

In this article I address one such challenge faced by contemporary zoos in the United States: the problems and tensions inherent in staging "naturalistic" exhibits that offer aesthetically pleasing and edifying depictions of the natural world, all while adhering to appropriate standards of animal husbandry and care. Given the complexities involved in exhibiting nature to the public under such conditions, the creative work of zoo exhibit designers, landscape architects, and other professional craftspeople who I call *nature makers* is implicitly defined by a set of organizational dilemmas and strategies of impression management in zoos.¹ In the pages that follow, I discuss a number of such dilemmas encountered by nature makers when creating naturalistic zoo exhibits, including those related to enclosure technologies, landscape immersion, animal appetites and inclinations, and environmental enrichment. I then outline three specific strategies of nature making: the *spatial* control of sight lines; the *simulation* of nature through plant simulators, synthetics, and live animal handling practices; and the *censorship* of certain animal behaviors and husbandry practices from public view. I argue that these strategic practices guide how zoos perform the craft of nature making as both expressive and utilitarian work. Given how many Americans experience the natural world in highly controlled environments where professional nature makers manage audience perceptions and meaning—national and state parks, wildlife and game preserves, science museums, and of course, zoos and aquariums—such spaces are ideal social worlds for examining the culture of nature in contemporary life.²

THE CULTURE OF NATURE

In many ways, nothing could be more self-evident than the staged or manufactured authenticity (MacCannell 1999; Grazian 2003) exhibited in naturalistic zoo displays. No visitor approaching an Amur tiger's enclosure at the Philadelphia Zoo would somehow mistake its glass-walled habitat for the Siberian tundra. And yet zoo audiences nevertheless expect zoo exhibits to prominently feature elements of the natural environment, even those based on romanticized imaginings of the wild. Like moviegoers and theater buffs who give themselves over to the virtual realities provided by the compelling special effects of cinema and the stage despite their obviously fabricated quality (Goffman 1974:130; Grazian 2008:93–94), zoo visitors enjoy lush and lively immersive displays and "safari" rides that evoke a sense of authenticity, however illusory.

Zoo audiences have long preferred such picturesque environments to more modernist exhibits that emphasize functionality through cheerless and antiseptic technologies, such as barred steel cages and easily washable concrete floors (Coe 1996:170–171).

For this reason, the 20th century has been marked by successive attempts at providing American cultural consumers with naturalistic experiences through immersive exhibition and spectacle. Early examples include Carl Hagenbeck's Arctic panorama suggestive of a polar landscape replete with sea lions and penguins at the 1904 St. Louis World's Fair (Hanson 2002:142); Carl Akeley's arrestingly realistic dioramas in his Hall of African Mammals at New York's American Museum of Natural History (Kirk 2010); and the expertly landscaped African plains exhibit at the Bronx Zoo and the Jackson Hole Wildlife Park in Wyoming, both launched in the 1940s (Mitman 1996). Recent decades have seen the increased popularity of landscape immersion and what has been called the "new naturalism" in zoos, in which exhibits ensconce the viewer within simulated habitats largely through plantings, soundscapes, props, and other dramaturgical tools, and provide realism based on actual scientific field research on wild animal environments (Coe 1996). It has been argued that today a growing "culture of enchantment" (Gibson 2009:11) moves many contemporary audiences to experience the sacredness and spirituality they attribute to animal life and the natural world by consuming wildlife documentaries and other popular cultural entertainments that glorify nature as unadulterated and pristine. Naturalistic zoo displays serve a similar purpose.

Of course, representations of *nature* always rely on the materials of *culture*, and in zoo exhibits, they include man-made synthetics, animal management practices, and live interpretive performances by zoo staff and volunteers. Staging naturalistic zoo exhibits additionally requires that nature makers negotiate among a variety of competing aesthetic and organizational demands. Notably, zoos must create visually pleasing and sufficiently entertaining exhibits and animal presentations that offer enough scientific realism that they can serve an educational purpose, while simultaneously providing enclosed living quarters for live animal species that maximize their health, comfort, safety, and enrichment.

On its face, this may seem like a simple proposition, yet numerous instances illuminate the inherent difficulties involved in pulling off truly naturalistic yet satisfying performances for the public. Zoo visitors gravitate toward exhibited African lions to observe them at play and hear their ferocious roars, yet by nature, lions rest approximately 20 hours a day (Maple and Perkins 1996:213). Patrons yearn to see furry zoo residents frolicking about together in sociable groups, but many captive animals are solitary creatures by nature, or else resort to dangerous games of hierarchical dominance when placed in proximity to one another. Zoo guests bemoan the fact that padlocked enclosures can seem like prisons, forgetting that such precautions are often necessary to protect exhibited animals from feral trespassers that might attack them, or steal their zoo-provided meals.

Negotiating these competing demands—the cultural expectations of audiences, the educational mission of zoos, and the practicalities of managing live animal species—gives rise to a particular set of strategies of impression management, a kind of dramaturgical performance that I call *nature making*.³ Nature making in zoos requires adherence to a set of aesthetic conventions regarding what audiences collectively imagine the natural world to feel and sound like, as illustrated by the popularity of

attractively landscaped immersive exhibits densely overrun with lush vegetation, and frosty polar bear and penguin habitats filled with snow and ice. In such exhibits, designers ideally attempt to hide all visible signs of artificiality, man-made technology, and human domination over animal species (Mitman 1996:120), just as modern societies typically erect mental barriers between human settlements and the natural environment. Sociologists recognize how such culture/nature boundaries are socially constructed and negotiated in the context of lived experience and interaction (Bell 1994; Fine 1998; Jerolmack 2008).

Reputable zoos not only engage in nature making to create delightful and aesthetically pleasing cultural attractions but also to provide educational opportunities for the public as well, which many in the zoo industry argue is the *primary* goal of zoos.⁴ In recent years, zoo educational programming has emphasized greater public awareness of the endangerment of wildlife populations as well as environmental issues such as biodiversity loss, habitat destruction, energy and resource conservation, and climate change. Within both the zoo industry as well as among upwardly mobile families, specifically those attentive to parenting strategies that target the “concerted cultivation” of their children through participation in enriching leisure activities (Lareau 2003), scientific education provides a loftier warrant for the existence of zoos than mere entertainment.⁵ In keeping with their educational priorities, zoos must therefore present aesthetically *attractive* animal displays while adhering to scientifically *accurate* and thus edifying renderings of the natural environment and its ecological realities. This can be a tricky feat, because although zoo visitors may crave “realism” in naturalistic zoo displays, it is often an idealized realism void of the unpleasant sensory features of many ecosystems, such as animal feces and regurgitated prey. As James Parker (2011:45) observes in an essay on nature-based reality television shows for the *Atlantic*, “Nature unobserved, unsentimentalized, unpolluted with our delusions, is just a bunch of stuff eating itself.”

Nature makers in zoos must also balance the aesthetic tastes shared among visitors with the health, safety, and overall contentment of the animals in their collections. This includes designing and maintaining secure yet comfortable enclosures for a variety of living creatures, feeding them individually calibrated diets, and providing veterinary care, exercise, stimulating enrichment, and opportunities for reproduction. While in the past, zoo animal collections consisted of healthy specimens gathered from the wild, today zoos usually rely on animal populations either born and bred in captivity, abandoned by negligent owners, or else injured in the wild and subsequently rescued and rehabilitated. These managed populations are therefore dependent on their caretakers for their fitness, sustenance, and protection, and indeed, many zoo animals could not survive in the wild at all without such assistance.

Of course, audiences seek out naturalistic zoo exhibits not merely for their own amusement, but often out of concern for the health and well-being of the captive creatures that reside in them. In these instances, zoo visitors attempt to assume the role of “surrogate consumer” (Hirsch 1972) on behalf of the resident animals they view on display, although what nonexperts deem “natural” and therefore accommodating to

captive animals does not always correspond to their genuine needs or the scientific realities of living in the wild. As both expressive and utilitarian work, nature making in zoos therefore requires careful sensitivity to the concerns of resident animals and the goals of zoo educators as well as the cultural expectations of audiences.

STUDYING ZOOS

From 2009 to 2012, I conducted over 500 hours of intensive fieldwork while volunteering at two metropolitan zoos, each located within a 25-mile radius of the downtown area of a major American city. At one institution (which I call City Zoo), I worked primarily in the children's zoo, where I was responsible for cleaning enclosures and exhibits, preparing and distributing animal diets, managing children in a petting yard filled with goats and sheep, and providing behavioral enrichment to a variety of creatures. (Along the way, I shoveled chicken and cattle manure, picked horse and donkey hooves, scrubbed owl and macaw cages, stuffed frozen feeder mice with vitamin E capsules and raw beef, and bathed and exercised tortoises and armadillos.) At a second zoo (which I call Metro Zoo), I served as a docent, or volunteer educator, where I handled and presented a variety of live small animals to zoo visitors. In this capacity, I worked with boa constrictors and ball pythons; blue-tongued skinks, fat-tailed geckos, and bearded dragons; screech owls and black vultures; tarantulas and millipedes; two giant Flemish rabbits; and a small American alligator. At Metro Zoo, I also occasionally prepared animal diets for most of the animals in the zoo's collection, which included jaguars, cougars, bison, wolves, Jamaican fruit bats, and river otters.⁶

While on and off the job, I conducted field observations, took digital photographs, and conversed with zookeepers, animal curators, veterinarians, educators, administrators, zoo architects, docents and other volunteers, as well as hundreds of zoo visitors. I wrote and recorded quick jottings while on site, and later wrote up more extensive and detailed field notes after each fieldwork session. I complemented this intensive ethnographic fieldwork by conducting a broader range of secondary observations at 18 institutions accredited by the Association of Zoos and Aquariums (AZA) throughout the United States.⁷ I also attended the 2011 AZA annual conference in Atlanta, where I met with zoo industry personnel from around the country, attended numerous sessions on zoo design and exhibition, animal management, conservation and zoo branding, and toured both public and backstage areas of Zoo Atlanta and the Georgia Aquarium with conference participants.

DILEMMAS IN NATURALISTIC ZOO DESIGN

The expert zoo designer Jon Coe (1996:171) advises contemporary nature makers to "invent an exhibit scenario that fully describes the exhibit context, just as a cinematic or theatrical scenario sets the scene for a performance. The scenario should establish the place being re-created in terms of geography, geology, bioregion, and habitat." Yet even under the most favorable of circumstances, nature makers often encounter dilem-

mas when engaged in naturalistic zoo design. In this section, I discuss a number of these dilemmas, each pertaining to a different set of issues in exhibit construction and public zoo presentation: enclosure technologies, landscape immersion, animal appetites and inclinations, and environmental enrichment.

Enclosing Animals

Whether for agriculture, scientific research, or recreational purposes, managing captive animal populations requires the use of elaborate enclosure technologies designed to prevent escape as well as vandalism or sabotage, both for the safety of the animals as well as human visitors and the public at large. Of course, it bears remembering that barriers function (ideally, at least) to keep zoo animals inside their enclosures as well as keep dangerous animals *out*, whether they be mountain lions, stray dogs, foxes, raptors, or even other escaped zoo animals. And lest we forget, zoo animals can find themselves visited upon by the least predictable trespassers of them all, *Homo sapiens*. Instances abound of human intruders sneaking into lion and other wildcat enclosures both during and after zoo hours, only to be devoured (Robinson 2004:77).

But while enclosure technologies may remain crucial to the display of live animals at zoos, it should surprise no one that many zoo aficionados and experts denounce traditional padlocked cages lined with iron or steel bars as antiquated and inhumane devices of incarceration. In addition, zoo visitors are simply more likely to dwell longer at exhibits unobstructed by visual obstacles or metal screens (Bitgood, Paterson, and Benefield 1988:487). It would therefore seem that nature makers in zoos ought simply to replace old-time zoo cages with either less conspicuous technologies of captivity, such as micro-thin electric wiring or large panes of transparent glass, or else naturalistic moats that allow for unobstructed and thus more seemingly realistic depictions of their "wild" animals on display.

Yet each of these technologies creates a new set of problems that runs counter to the aforementioned priorities established by zoos. While micro-thin electric cables, or "hot wires," can seem practically invisible even at close range, they are no panacea. Most obviously, electric shocks can cause pain to animals. In reality, the wires often do not work at all, as thick-skinned animals can withstand high voltages, while others have learned to short-circuit such cables with sticks (Hancocks 1996:197). Meanwhile, other seemingly "invisible" enclosure technologies can be just as conspicuous as iron cages themselves. For example, some argue that glass-paneled enclosures actually *amplify* the psychological barrier between the animal and the human viewer, as they mute animal sounds and smells while reflecting sunlight glare during daytime hours (Hancocks 1996:194, 198).

Given these limitations, moats would seem to provide a more perfect solution, alleviating the need for bars, panes of thick laminated glass, or any other physical impediments to visibility, scent, and sound on the part of visitors. The wide berth they provide can potentially help protect zoo animals from pathogens spread by humans (and vice versa), inappropriate or even toxic foods that visitors might surreptitiously try to feed them, and projectiles that ill-manned visitors might throw at them (a com-

plaint made by staff at both City Zoo and Metro Zoo). Yet a moat can take up much-needed space in a zoo exhibit that can otherwise be appropriated for larger living areas for animals on display. As Jeffrey Smith, a landscape architect at a leading American zoo design firm, explained to me:

Moats and pools are very aesthetically pleasing; you can have dry moats that form the same kind of earth barrier. But those often take up usable habitat for the animals . . . you're taking away space where these animals can go. So you have to weigh that back and forth. . . . If their space is more limited, they may decide not to go with the moat and do the barriers. . . . Ideally, if it was just aesthetics, you would not see any barriers and have lots of space and do everything you want, but often-times the zoo may only have two or three acres to do an elephant habitat. Do you really want to take up a third of that with moats that are unusable by animals? (Interview, July 5, 2011)

Moats and pools also pose certain risks to animal safety. For instance, "many great apes have drowned in deep water moats" (Maple and Perkins 1996:214). Likewise, although moats can prevent certain kinds of animal escapes, they sometimes cannot stop feral creatures from encroaching into zoo animals' living spaces. At Metro Zoo, bald eagles enjoy an open-air exhibit, and no wonder: as injured birds rescued from the wild, they pose few flight risks. On the other hand, regional flocks of wild black vultures regularly swoop into the cageless enclosure in their attempts to pilfer the eagles' carefully calibrated diets.

Landscape Immersion

In the last several decades, zoo exhibits have increasingly relied on techniques of immersive landscaping and elaborate stagecraft to display their captive animals in settings that mimic dramatic natural environments, whether Indonesian tropical rainforests, Kenyan savannas, or ice floes drifting through the Arctic Ocean. Nature making therefore relies as heavily on the botanical and horticultural sciences as it does on zoology and animal behavior. In keeping with the educational aims of many zoos, some of the most sophisticated immersive exhibits encircle zoo animals with plants that are naturally indigenous to their native ecosystems and use such exhibits as educational tools designed to teach guests about biogeography as well as habitat preservation and other environmental issues. In Hershey, Pennsylvania, ZooAmerica exclusively exhibits North American flora and fauna, with five areas that emphasize regional habitats and their indigenous plant life. The Arizona-Sonora Desert Museum in Tucson takes this a step further by only exhibiting local plants, animals, minerals, and fossils indigenous to the Sonoran Desert region of the southwestern United States.

Yet this attempt on the part of zoos to present ecologically accurate portrayals of wild habitats for both aesthetic and educational purposes can be all too easily undermined by the realities of animal management, and occasionally by Mother Nature herself. At the most obvious level, zoos feature exotic animals from all over the world,

and the plants indigenous to their regional native habitats simply cannot survive outdoors in zoos located in radically different geological or climatic zones. The Detroit Zoo is home to black-and-white ruffed lemurs and tree boas indigenous to the forests of Madagascar, yet native plants such as the tropical species of palm endemic to that island country cannot easily be transplanted to the zoo's outdoor exhibits, with its frigid Michigan winters.

Likewise, while nature-loving visitors may find fault with the use of synthetic trees and concrete termite mounds in zoo exhibit construction, organic materials can attract disease-spreading microbes and insects. Although wood may seem like more of an aesthetically "natural" material to construct exhibit walls than fiberglass, wood walls also provide shelter to mice, cockroaches, and other pests (Rosenthal and Xanten 1996:223). Zoo animals such as apes can destroy the elaborate plantings of even the hardest of landscaped exhibit environments. For instance, according to the field primatologist Dian Fossey (1983:47–48), in the forests of Rwanda wild gorillas tear up their surrounding vegetation to build new nests in different locations on a *nightly* basis, and Fossey suggests that such behavior may be innate, even among zoo apes born in captivity.

Animal Appetites and Inclinations

Although the educational mission of accredited American zoos encourages adherence to scientifically accurate renderings of the natural world, many of the realities of animal life might be considered normatively inappropriate to young zoo visitors and aesthetically unpleasant to their older counterparts as well. Regarding the former, zoos often struggle with the question of how much information about animal mating and sexual behavior ought to be explained to small children and preteens. (Of course, when zoo animals copulate or simulate intercourse in public view, there is often little that can be done to stop them in flagrante delicto regardless of who may be watching the drama unfold.) Meanwhile, in the petting areas of zoos featuring barnyard animals, goats, and sheep occasionally urinate while in the company of children or their parents (and sometimes they do so *on* those unlucky visitors).

The diets fed to zoo carnivores may similarly repulse visitors of all ages, including the sorts of foods that approximate what these animals would naturally hunt, ravage, and eventually consume in the wild: dead rats, mice, quail, rabbits, chicks, and guinea pigs, and living mealworms and crickets. Mealworms and other insects are often the most substantial live creatures fed to carnivores in American zoos. This solution neatly avoids public outrage over the sight of carnivores eating living prey; and yes, it also spares would-be prey animals from being eaten alive. (Live prey can also present dangers to predators themselves, particularly if they are defensively attacked and injured by their intended meals.)

A somewhat related dilemma in nature making at zoos concerns how the relative sociability (or lack thereof) of certain animals should be represented in zoo exhibits. On the one hand, evidence suggests that visitors are attracted to zoo mammals exhibited in social groups, especially when such groupings include infants (Bitgood

et al. 1988:482–4). Yet many zoo mammals, such as the coati (a member of the raccoon family), are by nature solitary creatures that live alone in the wild. Other animals' social behaviors vary dramatically according to life cycle: for example, in some species, adults only comele during mating periods (Seidensticker and Doherty 1996:187). Zoo personnel must measure the fondness visitors feel toward displays of mammals socializing in groups against the need to create zoologically accurate depictions of the wild, and additionally take into account the added expenses and resources required to segregate them into multiple enclosures when necessary. Of course, many social animals live in intensely hierarchical groupings in the wild and might therefore be at risk of attacking (or being attacked by) members of their own species if placed in proximity to one another in zoo exhibits.

Environmental Enrichment

Life in a zoo has its advantages: a regular and safe supply of food for life, consistent veterinary care, protection from the elements, and freedom from fear of being devoured by predators. The downsides are equally obvious, including spatially constrained living quarters, a general lack of privacy, limits on mobility and autonomy, and bouts of irrepressible boredom. To compensate for the dullness of captive living, AZA-accredited zoos in the United States must provide their animals with "enrichment," or additions to their environment that will hopefully bring out their animals' "naturally" occurring behaviors while stimulating brain activity. For example, keepers might hide a bobcat's ration of ground beef and bones in the crevices of a hollowed-out tree stump. They might scatter raisins about the grounds of a gorilla's enclosure, so that it must forage for its food as it would in the wild. The introduction of environmental enrichment in zoo exhibits can not only encourage activity in otherwise inactive captive creatures, but can also help reduce abnormal stereotypic behaviors symptomatic of boredom, stress, anxiety, frustration, or fear in animals, such as regurgitation, self-mutilation, chain-chewing, pacing, or other repetitive movements (Maple and Perkins 1996; Carlstead 1998).

Environmental enrichment often consists of playing and climbing apparatuses, swimming pools, manipulable objects, toys (e.g., puzzle feeders, plastic balls, etc.), scratch posts, tree branches and hollow logs, loose browse, and nest boxes. Zoo personnel also provide enrichment by making changes to the ambient sound or even odor of their animals' environments. To accomplish the latter, keepers may add designer fragrances to their enclosures. The African wild dogs at the Philadelphia Zoo enjoy Chanel No. 5; the San Diego Zoo's giant pandas prefer Ralph Lauren Polo for Men; and at the San Diego Zoo Safari Park, tigers are given deer antlers sprayed with Calvin Klein's Obsession as enrichment.

In addition, enrichment encompasses animal management practices that provide mental stimulation while preventing stereotypic behaviors, as in the aforementioned example of providing novel foraging opportunities as well as other modified feeding routines. For example, one autumn morning before visitors arrived, Metro Zoo animal keepers served the zoo's two timber wolves a freshly killed deer carcass shot by a local

bowman, thus providing the carnivores with the opportunity to experience hunting-related behaviors while in captivity. Contemporary enrichment strategies also include innovations in animal rotation in which different species alternate among a variety of exhibit enclosures, offering zoo animals new opportunities for exploration outside the confines of their everyday habitats. In 2011, the Philadelphia Zoo unveiled its Treetop Trails, a \$1.5 million experimental zoo enrichment system in which animals traverse the zoo on their own through an elaborate system of overhead bridges, walkways, and lookouts. Golden lion tamarins, white-faced sakis, red-capped mangabeys, and other exotic primates climb through 700 feet of elevated paths among the trees, free to take in a birds' eye view of local wildlife as well as neighboring zoo attractions.

Studies show that among zoo gorillas and orangutans, the presence of enrichment objects, especially movable objects, may matter even more than the size of their enclosures in encouraging activity (Maple and Perkins 1996:215). Yet environmental enrichment does not only augment the physical and psychological welfare of zoo animals, but ultimately the popular success of zoos as well. Zoo visitors spend twice as much time viewing exhibited animals engaged in physical activity as compared with when those same creatures are inactive (Bitgood et al. 1988:480–1). Visitors are also disturbed when they witness repetitive stereotypic behaviors such as pacing or regurgitation among zoo animals. Enrichment can therefore serve to increase visitor satisfaction as well as provide stimulation and therapeutic relief for captive animals.

However, while active zoo animals may exhibit behaviors common to their brethren in the wild, many successful enrichment objects—ping-pong balls, tractor tires, oil drums—clearly do *not* appear in the natural environment, and may therefore interfere with the authenticity and scientific realism otherwise suggested by a more naturalistic aesthetic. At City Zoo, orangutans swing from Kevlar-lined fire hoses (which are more difficult to shred than ropes), while turkeys and guinea fowl peck at broom heads; rabbits play with colored wooden blocks and wicker balls stuffed with carrot bits. At Metro Zoo, cougars occasionally stalk an empty beer keg and enjoy venison served out of big plastic blocks. Jaguars play with old sneakers; and Cheerios boxes stuffed with newspaper adorn an indoor enclosure featuring a green iguana, cotton-top tamarin, and a red-footed tortoise. As Terry L. Maple, an AZA past president and former director of Zoo Atlanta, and conservation biologist Lorraine A. Perkins, observe, “in highly naturalistic environments, toys and equipment may detract from the carefully crafted illusion of realism” (Maple and Perkins 1996: 218).

STRATEGIES OF NATURE MAKING AS IMPRESSION MANAGEMENT

Naturalistic zoo exhibition presents a set of dilemmas for nature makers, including those related to enclosure technologies, landscape immersion, animal appetites and inclinations, and environmental enrichment. They consequently rely on three specific strategies of nature making in order to overcome these dilemmas: (1) the *spatial* control of sight lines; (2) the *simulation* of nature through plant simulators, synthetics, and live animal handling practices; and (3) the *censorship* of certain animal behaviors

and husbandry practices from public view. These strategies are both expressive and utilitarian in nature.

Spatial Control

One set of strategies employed in naturalistic zoo design involves controlling the sight lines and visual experiences of both animal and visitor alike through the manipulation of space. An obvious impediment to creating an illusion of wilderness in zoos is that animal habitats in the wild are massive, particularly among nomadic creatures such as polar bears and wolves. Nature makers therefore make strategic use of sight lines to create an illusion of limitless space and total animal control over the environment. At the Philadelphia Zoo, the Amur tiger exhibit features a variety of angled windows that prevent visitors from ever seeing the entire habitat at once. This provides multiple viewing opportunities while making the enclosure seem deceptively larger than it actually is. This illusion of vastness and perception of animal freedom is heightened in zoos that cleverly employ sight lines to appropriate surrounding elements of the nearby natural landscape (such as trees, hills, and mountain ranges) as theatrical backdrops for animal displays. While the Brandywine Zoo in Wilmington, Delaware, sits on only 12 acres, its scenic surroundings include a 178-acre state park thick with foliage that envelops the zoo grounds, providing an impressive *mise-en-scène* for its outdoor exhibits.

Nature makers also strategically elevate exhibit spaces above public viewing areas, thereby placing visitors in a spatially subordinate position relative to animals on display. In the grassland habitats of Metro Zoo, spectators feel the majesty of massive elk that peer down at them from the top of their steeply sloped enclosure. The San Diego Zoo's Lost Forest immersive exhibit requires visitors to gaze up at Malayan tigers perched at terrific heights. According to Coe (1985:203–204), “the simple procedure of locating the animal in a position or location superior to the viewer may relatively predispose the viewer to want to learn from the animal, be more attentive to it, and perhaps be even more respectful of it.”

In addition to clever architectural design, nature making also involves the strategic placement of environmental enrichment designed to coax otherwise shy animals into public view. One familiar trick involves placing heat-emitting sources, such as hot rocks, in the front of reptile exhibits in order to maximize visitor views. Like all cold-blooded creatures, reptiles such as iguanas, geckos, turtles, and crocodiles rely on environmental sources of heat because they cannot regulate their body temperatures internally. Therefore, zoo personnel include heated rocks and other thermal sources in herpetology enclosures and deliberately position them so as to lure captive reptiles toward the most visible exhibit areas. Keepers also often place enrichment, food, or water in prominently visible areas of zoo exhibits to coax captive animals out of hiding.

Simulating the Wild

Natural-looking immersive landscapes rely on man-made materials, including artificial rocks and trees made of gunite, fiberglass, and epoxy, to say nothing of the

design-intensive curved aquarium glass windows, hi-fidelity sound systems, and advanced parasite control technologies used in zoos. In part, this is because of the difficulties involved in using organic materials in zoo environments; as noted above, zoo animals such as nest-building apes can easily destroy the planted vegetation in their landscaped exhibit environments. In such instances, synthetics are employed to simulate the natural world. At the San Diego Zoo, orangutans climb up artificial "trees" made of steel. The Francois' langur exhibit at the Los Angeles Zoo features five outdoor pine trees, also made from steel. The company (named, perhaps appropriately, NatureMaker) that designed and fabricated those fire-retardant pines promises that each of its trees will be "87 percent botanically accurate" and advertises its products and services in its promotional materials by tapping into the adoration for naturalism among zoo audiences and educators alike:

Idyllic. Majestic. And perfectly imperfect. Exactly as Mother Nature intended. . . . Bug holes. Fungus, moss and decay. Twisted, knobby, contorted and distorted trunks and limbs. Faithful reproductions for hands-on discovery, but are they realistic enough to convince the animals at the zoo? Absolutely, but don't tell any of them. They've been living comfortably among NatureMaker Steel Art trees for years.

Look closely and you'll see painstakingly-sculpted impressions of real bark with all its natural anomalies. Step back and sense the grandeur of the tree's presence. What could be more important to educators, museum administrators, librarians—anyone whose vocation is to educate? The curious always inhabit the confluence where art and nature intersect. NatureMaker truly sees the forest for the trees.

As both expressive and utilitarian objects, steel trees can help zoos stage simulated environments that neither elephants, rhinoceroses, orangutans, nor gorillas can easily destroy, all while saving on expenses such as pest control, irrigation, and drainage. Yet as noted above, nature makers not only must protect plantings from powerful animals, but also from basic climate and weather patterns as well. Again, zoos frequently display animals from all over the world, yet the plants indigenous to their specific native habitats simply cannot survive outdoors in zoos located in inappropriate geological and climatic zones. Give the eagerness among zoos and their audiences for authentic-looking immersive landscaping, nature making in North American zoos often involves the use of "plant simulators," domestic plants that perform the role of native plants from South America, Asia, and Africa. For example, according to Zoo Atlanta horticulturalist Donald Jackson (1990:14–15), the leaves of plants found in West African tropical rainforests have "large leaves with a relatively smooth, waxy upper surface and long 'drip tips,' two features that help shed excessive rainfall in the humid tropics." Therefore, credible plant simulators for a West African lowland gorilla exhibit at a North American zoo, for instance, could include smooth sumac and staghorn sumac, tulip poplar, royal paulownia, northern catalpa, and a variety of magnolia (Jackson 1990:16–17). As Jeffrey Smith, the aforementioned zoo landscape architect, explained to me:

In Africa, tropical plants have one big single leaf, so we look for plant species like hostas, for example—a very common perennial that has a large leaf that looks very jungly. In a setting where you can't grow big tropical leaf plants, you might be able to grow a hosta, because they are very cold-hardy in northern climates, for instance, so that's one African jungle rainforest simulator. (Interview, July 5, 2011)

Finally, sometimes zoos do not merely simulate *plantings* as they might appear in the wild, but their *animals* themselves. For all intents and purposes, zoo animals are nearly as domesticated as if they were house pets: they are fed carefully calibrated diets, given regular veterinary care, and assigned human names. Yet when exhibited to the public, zoo animals frequently play the role of wild beasts, often with the help of zoo personnel. As Metro Zoo's docent handbook instructs all volunteers performing live animal presentations:

A clear and consistent message of conservation and education must be a pertinent part of every program presented by Metro Zoo. It must also be made very clear that our program animals are NOT pets and are to be presented as captive representatives of the wild population.

Docents are therefore instructed during their training that because zoo animals "are representative of wild species," they are not to caress the animals as if they were pets, nor address zoo animals using "baby talk" when in the presence of visitors, even though such behavior is fairly common among zoo staff and volunteers behind the scenes.

The display of animals as wild creatures also extends to their physical appearance. For example, in the wild, flamingos feed on brine shrimp, which contain beta-carotene; it is for this reason that their plumage is famously bright pink. (Beta-carotene is the same organic compound that makes carrots orange and tomatoes red.) However, at zoos, flamingos enjoy a more managed diet that often does not include shrimp, which would therefore make their feathers exhibit a pale pink or even white coloration—if not for the fact that many zoos now feed their flamingos pellets with extra beta-carotene, simply so that they will retain their pinkish hue. In this sense, the pigmentation of captive flamingos in zoos functions as a kind of aviary costume for their public performances as "wild" birds.

Censoring Nature

In naturalistic zoo exhibition, a third strategy of impression management involves the censoring of certain animal behaviors and husbandry practices from public view, in the interests of masking some of the more aesthetically unpleasant or uncomfortable aspects of zoo work. In their attempts to create an entertaining landscape for audiences—particularly families with children—zoos will sometimes purposely avoid trespassing sensitive boundaries regarding socially constructed definitions of

pollution (Douglas 1966) that may alienate some visitors, despite the potential contribution that revealing such realities to the public might make toward their educational mission.

First, while exceptions exist, it is not uncommon to hide from public view the feeding of prey (live or dead) to zoo animals, either by spatially or temporally sequestering such practices from audiences. This is especially the case in children's zoos and other areas designated for young visitors. At City Zoo, keepers and volunteers working in the children's zoo yard prepare and distribute dead feeder mammals and birds to owls, hawks, and other raptors on a daily basis. These carnivorous diets include the bleeding carcasses of thawed frozen mice (referred to in the industry as "pinkies" and "fuzzies," depending on size), white rats, quail, and yellow chicks, some stuffed with additional helpings of raw meat. Zoo personnel regularly dole out these morsels to zoo animals about 15 to 30 minutes before closing time, after most young visitors have already exited the park grounds and thus will not be exposed to such a grisly menu. (Meanwhile, patrons are invited to purchase, handle, and distribute sanitized pellets of grain to the zoo's goats and ducks.) Although carnivorous animals naturally eat other animals, this fact is often kept from children at zoos, who would likely be disturbed by the sight of dead prey.

Again, while exceptions obviously exist, this is not necessarily an uncommon practice among American zoos. At one accredited zoo in the southern United States, a keeper in an African birds exhibit explained to me:

We have feeding platforms out here [in public] . . . and then we will also put some food upstairs [out of public view]. One of the things we put upstairs is for the meat-eating birds, because most people find it a little distasteful when they see one picking up a pinkie [a small mouse] or something like that. . . . They are all dead. They are frozen, that we feed them. We also feed them commercial-type meat that we mix the insectivore pellets in. So people are okay with that—but they generally don't want to see them eating mice. We feed that upstairs [out of view], and the birds will take those to their nesting area.

I think if you have someone around that can explain that owls eat mice, I think that's acceptable. *But* I think it is not something you want to throw in everybody's face. You know, sometimes the birds will drop the pinkies on the ground, and it is kind of weird. We can feed mealworms or different types of worms out here and people don't seem to have an emotional attachment to it, but if you feed crickets out here—maybe it's the whole Jiminy Cricket thing, you know—people do seem to have an emotional attachment. So, we do feed crickets, but we usually wait until after hours to put them out.

It just seems to be human nature that you can feed fish; people don't seem to have a problem with that, as long as they're dead—you don't want to see anything flopping around. Anything with fur, they seem to have issues with. . . . I have done some raptor programs where we fed large mice to raptors, and the

people who were interested watched, and they understood that that is what these birds eat in the morning. But we can't always explain it that way. (Field notes, October 11, 2010)

In addition to the strategic scheduling of feeding times, another strategy of censoring nature at zoos involves the partial dismemberment of prey fed to exhibited animals on display. During the aforementioned episode in which keepers at Metro Zoo served a deer carcass to its timber wolves before visiting hours, a staff person explained that the deer's head and limbs were removed prior to feeding so that zoo visitors "don't think of Bambi" if they should arrive before the wolves have finished devouring their meaty breakfast (field notes, November 2, 2011).

Second, during live presentations, zoo educators tend to mute any allusions to animal mating or sexuality, especially when in the presence of small children; again, here, the mission to provide accurate scientific knowledge to guests is carefully weighed against the danger of potentially alienating families with children. At Metro Zoo, a volunteer coordinator warns a classroom of docents during a training session, "Don't talk about sex," even *nonhuman* animal sexuality, when within earshot of youngsters. Often, these warnings are communicated in a joking if nevertheless sincere manner, as when the coordinator advises, "For example, it would be inappropriate to say, 'A blue whale has a ten-foot penis,' in front of a bunch of six-year-olds" (field notes, May 28, 2011). At the same time, zoo animals can rarely be counted on to cool their sex drives on command, and so children often bear witness to rituals of mating or courtship (or at least a simulation of such activity) among a variety of creatures. At City Zoo, the turtles and tortoises who reside in the reptile exercise yard are probably the most notorious public exhibitionists on the premises.

In the event of such occurrences, City Zoo volunteers and staff are instructed to respond to curious children using strategies of misdirection and evasion along with a litany of fun animal facts. For example, when a young visitor asks, "What are those tortoises doing?" zoo volunteers are expected to respond with a question: "What do *you* think they are doing?" or "What does it *look like* they're doing?" If the child answers, "It looks like they are playing leapfrog," staff personnel are told to give a tactfully evasive response, followed by a quick change of conversation topic: "Yes, it does *look* as though they are playing leapfrog. . . . Say, *do you know how much food rhinos can eat in one day?*" (field notes, July 22, 2009).⁸

In addition to animal diets and sexuality, a third common aspect of nature routinely censored in zoos is death. One of the realities of zoos—as well as the natural world, of course—is the ubiquity of death and dying. While zoos devote an abundance of resources to veterinary care and animal safety, demographic research shows that captive zoo animals exhibit the same mortality rates as animals in the wild (Kohler, Preston, and Lackey 2006). In fact, during my fieldwork, many resident creatures died at both City Zoo and Metro Zoo, including species such as American alligator, hognose snake, greater rhea, African pygmy hedgehog, Chacoan peccary, and Scottish highland cattle.

Nevertheless, zoo deaths are often painstakingly hidden from visitors, especially young children. Shortly before I began my fieldwork at City Zoo, two feral foxes entered the chicken coop in the barnyard exhibit one night and devoured about 20 chickens. The staff managed to clean up the mess before any children arrived. The timing of the cleanup was very deliberate—I asked Mike, one of the zookeepers, what would have happened if any children had witnessed the aftermath of the incident. He admitted that it probably would have scared them and made them cry. Sean, another zookeeper, assured me that “it would never happen,” that they would never expose children at the zoo to such gore. If any kids did happen to find feathers strewn about the yard, he said the keepers would sooner *lie* to young visitors and make up a story about how the chickens lost some of their feathers by fighting one another, rather than reveal such savagery and carnage (field notes, September 15, 2009). At Metro Zoo, staff personnel sometimes need to surreptitiously kill predator insects such as dragonflies in the butterfly house, in order to protect the monarchs and moths on exhibit. As volunteer docents are advised, “If you need to, squash it with your foot. . . . And if nobody’s there to see it, then *it didn’t happen*.” Volunteers are also instructed to euthanize injured butterflies with broken legs or wings, given their inability to survive; however, they are instructed to do so “when no kids are around” (field notes, May 28, 2011).

CONCLUSION

Representations of nature always rely on the materials of culture, and in zoo exhibits, they include man-made synthetics, animal management practices, and live interpretive performances by zoo staff and volunteers. In this article, I argued that staging naturalistic zoo exhibits additionally requires negotiation among a variety of competing aesthetic and organizational demands: specifically, the cultural expectations of audiences; the educational mission of zoos; and the practicalities of managing live animal species.

The negotiation of these demands gives rise to nature making, a particular set of impression management strategies employed in zoos. In outlining the contours of nature making, I discussed a number of dilemmas encountered when creating naturalistic zoo exhibits related to enclosure technologies, landscape immersion, animal appetites and inclinations, and environmental enrichment. I then described three specific strategies of nature making: the spatial control of sight lines; the simulation of nature through plant simulators, synthetics, and live animal handling practices; and the censorship of certain animal behaviors and husbandry practices from public view. These strategic practices guide how zoos perform the craft of nature making as both expressive and utilitarian work. Given the large numbers of contemporary Americans who experience the natural world in environments mediated by professional nature makers, such spaces present enormous opportunities for exploring the culture of nature.

While my focus in this article emphasizes the dilemmas and strategies of impression management found in American zoos, I would conclude by pointing out that these same kinds of problems, tensions, and techniques are also quite common among other organizations in the culture industries (Hirsch 1972; Becker 1982; Bielby and

Bielby 1994; Fine 1996; Peterson 1997; Grazian 2003, 2004, 2008). For instance, Gary Alan Fine (1996) argues that in restaurant kitchens, professional cooks and chefs negotiate tensions and contradictions among multiple goals during the food production process itself, notably by balancing client demands with aesthetic conventions, financial constraints, and organizational efficiencies. These tensions shape what Fine (1996:178) calls the "culture of production" in culinary work: a set of organizational dilemmas, priorities, and strategic practices that govern the preparation of cuisine as both useful and expressive labor. Like nature making in zoo displays, kitchen work and other kinds of aesthetic production requires cultural creators to negotiate among a variety of competing artistic conventions and institutional demands within a context constrained by market competition, budgetary limitations, organizational efficiencies, professional norms, audience expectations, and demand uncertainty. Consequently, these kinds of dilemmas give rise to a set of expressive and utilitarian practices that govern the production of culture, whether the end product is a steakhouse-prepared porterhouse, television sitcom, country music recording, or an immersive orangutan exhibit, steel trees and all.

ACKNOWLEDGMENTS

This research was made possible by the financial generosity of the University Research Foundation and the Penn Humanities Forum, both at the University of Pennsylvania. Lauren Johnston, Lauren Springer, and Natalie Volpe all provided helpful research assistance. This article has been greatly improved by remarks made on earlier drafts by Catherine Brinkley, Philip Cochetti, Brian Donovan, Gary Alan Fine, Alice Goffman, Tim Hallett, Philip Howard, Colin Jerolmack, Victoria Johnson, Annette Lareau, Caroline Lee, Lauren Rivera, Junhow Wei, and participants at talks given at Yale University's Center for Cultural Sociology, Rutgers University's Department of Sociology, and the University of Pennsylvania's Urban Ethnography Workshop and Penn Humanities Forum.

NOTES

¹Nature makers not only include artistic professionals such as zoo exhibit designers and landscape architects, but horticulturalists, animal curators, veterinarians, keepers, volunteer docents, and other zoo workers as well.

²For example, according to its Web site in 2012, the Association of Zoos and Aquariums (AZA) estimated that U.S. zoos receive 175 million visitors annually.

³Nature making should not be confused with Gary Alan Fine's (1998:2) concept of "naturework," which refers to the process by which consumers (rather than cultural workers) inscribe the natural environment with meaning.

⁴According to the AZA Web site, "In the last 10 years, AZA-accredited zoos and aquariums formally trained more than 400,000 teachers, supporting science curricula with effective teaching materials and hands-on opportunities. School field trips connected more than 12,000,000 students with the natural world."

⁵At the same time, some have argued that although organizational goals like scientific education and species preservation may appear on zoos' mission statements, such goals sometimes operate as institutional "myths" (Meyer and Rowan 1977) decoupled from their everyday activities and priorities. For example, Todd Bayma (2012) argues that during the 1970s, the AZA championed conservation (notably zoo-directed captive breeding programs) as a "rational myth" designed to promote not only the preservation of endangered species, but *institutional* self-preservation as well—as an organizational adaptation designed to head off both public criticism of zoos and the threat of heightened federal regulations.

⁶In keeping with standard ethnographic practice in sociology, I have changed the names of both zoos where I conducted intensive fieldwork, as well as any informants personally quoted in this article. Fortunately, no animals were harmed during this research, although I myself endured bites, scratches, and other humiliations from several domestic rabbits, a bearded dragon, an African gray parrot, and at least one goat.

⁷These visits included backstage tours at a number of facilities as well as extended periods of public observation at selected exhibits, animal shows, and other attractions.

⁸For the curious: According to the Zoo Miami Web site, the Indian rhinoceroses in their collection can devour 100 pounds of hay, produce, and food pellets in a single day.

⁹As I discovered during my fieldwork, in backstage areas zoos often make use of pest control devices (such as mousetraps, ant traps, and flypaper) to capture and exterminate rodents and insects, sometimes of the same genus and/or species as those animals represented in the zoos' exhibited collections.

REFERENCES

- Bayma, Todd. 2012. "Rational Myth Making and Environment Shaping: The Transformation of the Zoo." *The Sociological Quarterly* 53(1):116–41.
- Becker, Howard S. 1982. *Art Worlds*. Berkeley: University of California Press.
- Bell, Michael Mayerfeld. 1994. *Childerley: Nature and Morality in a Country Village*. Chicago, IL: University of Chicago Press.
- Bielby, William T. and Denise D. Bielby. 1994. " 'All Hits Are Flukes': Institutionalized Decision Making and the Rhetoric of Network Prime-Time Development." *American Journal of Sociology* 99(5):1287–313.
- Bitgood, Stephen, Donald Paterson, and Arlene Benefield. 1988. "Exhibit Design and Visitor Behavior: Empirical Relationships." *Environment and Behavior* 20(4):474–91.
- Carlstead, Kathy. 1998. "Determining the Causes of Stereotypic Behaviors in Zoo Carnivores: Toward Appropriate Enrichment Strategies." Pp. 172–83 in *Second Nature: Environmental Enrichment for Captive Animals*, edited by David J. Shepherdson, Jill D. Mellen, and Michael Hutchins. Washington, DC: Smithsonian Institution Press.
- Coe, John C. 1985. "Design and Perception: Making the Zoo Experience Real." *Zoo Biology* 4(2):197–208.
- Coe, John Charles. 1996. "What's the Message? Education through Exhibit Design." Pp. 167–74 in *Wild Mammals in Captivity: Principles and Techniques*, edited by Devra G. Kleiman, Mary E. Allen, Katerina V. Thompson, and Susan Lumpkin. Chicago, IL: University of Chicago Press.
- Douglas, Mary. 1966. *Purity and Danger: An Analysis of the Concepts of Pollution and Taboo*. London: Routledge.

- Falk, John H. and Lynn D. Dierking. 2000. *Learning from Museums: Visitor Experiences and the Making of Meaning*. Lanham, MD: Altamira.
- Fine, Gary Alan. 1996. *Kitchens: The Culture of Restaurant Work*. Berkeley: University of California Press.
- . 1998. *Morel Tales: The Culture of Mushrooming*. Cambridge, MA: Harvard University Press.
- Fossey, Dian. 1983. *Gorillas in the Mist*. Boston, MA: Mariner.
- Gibson, James William. 2009. *A Reenchanted World: The Quest for a New Kinship with Nature*. New York: Metropolitan.
- Goffman, Erving. 1974. *Frame Analysis: An Essay on the Organization of Experience*. New York: Harper & Row.
- Grazian, David. 2003. *Blue Chicago: The Search for Authenticity in Urban Blues Clubs*. Chicago, IL: University of Chicago Press.
- . 2004. "The Production of Popular Music as a Confidence Game: The Case of the Chicago Blues." *Qualitative Sociology* 27(2):137–58.
- . 2008. *On the Make: The Hustle of Urban Nightlife*. Chicago, IL: University of Chicago Press.
- Hancocks, David. 1996. "The Design and Use of Moats and Barriers." Pp. 191–203 in *Wild Mammals in Captivity: Principles and Techniques*, edited by Devra G. Kleiman, Mary E. Allen, Katerina V. Thompson, and Susan Lumpkin. Chicago, IL: University of Chicago Press.
- Hannigan, John. 1998. *Fantasy City: Pleasure and Profit in the Postmodern Metropolis*. London: Routledge.
- Hanson, Elizabeth. 2002. *Animal Attractions: Nature on Display in American Zoos*. Princeton, NJ: Princeton University Press.
- Hirsch, Paul M. 1972. "Processing Fads and Fashions: An Organization-Set Analysis of Cultural Industry Systems." *American Journal of Sociology* 77(4):639–59.
- Jackson, Donald. 1990. "Landscaping for Realism: Simulating the Natural Habitats of Zoo Animals." *Arnoldia: The Magazine of the Arnold Arboretum* 50(1):13–21.
- Jerolmack, Colin. 2008. "How Pigeons Became Rats: The Cultural-Spatial Logic of Problem Animals." *Social Problems* 55(2):72–94.
- Kirk, Jay. 2010. *Kingdom under Glass: A Tale of Obsession, Adventure, and One Man's Quest to Preserve the World's Great Animals*. New York: Henry Holt.
- Kohler, Iliana V., Samuel H. Preston, and Laurie Bingaman Lackey. 2006. "Comparative Mortality Levels among Selected Species of Captive Animals." *Demographic Research* 15(14):413–34.
- Lareau, Annette. 2003. *Unequal Childhoods: Class, Race, and Family Life*. Berkeley: University of California Press.
- MacCannell, Dean. 1999. *The Tourist: A New Theory of the Leisure Class*. Berkeley: University of California Press.
- Maple, Terry L. and Lorraine A. Perkins. 1996. "Enclosure Furnishings and Structural Environmental Enrichment." Pp. 212–22 in *Wild Mammals in Captivity: Principles and Techniques*, edited by Devra G. Kleiman, Mary E. Allen, Katerina V. Thompson, and Susan Lumpkin. Chicago, IL: University of Chicago Press.
- Meyer, John W. and Brian Rowan. 1977. "Institutionalized Organizations: Formal Structure as Myth and Ceremony." *American Journal of Sociology* 83(2):340–63.
- Mitchell, W. J. T. 1998. *The Last Dinosaur Book: The Life and Times of a Cultural Icon*. Chicago, IL: University of Chicago Press.

- Mitman, Gregg. 1996. "When Nature *Is* the Zoo: Vision and Power in the Art and Science of Natural History." *Osiris* 11(2):117–43.
- Parker, James. 2011. "The Beast Within." *Atlantic* June:42–5.
- Peterson, Richard A. 1997. *Creating Country Music: Fabricating Authenticity*. Chicago, IL: University of Chicago Press.
- Robinson, Phillip T. 2004. *Life at the Zoo: Behind the Scenes with the Animal Doctors*. New York: Columbia University Press.
- Rosenthal, Mark A. and William A. Xanten. 1996. "Structural and Keeper Considerations in Exhibit Design." Pp. 223–30 in *Wild Mammals in Captivity: Principles and Techniques*, edited by Devra G. Kleiman, Mary E. Allen, Katerina V. Thompson, and Susan S. Lumpkin. Chicago, IL: University of Chicago Press.
- Seidensticker, John and James G. Doherty. 1996. "Integrating Animal Behavior and Exhibit Design." Pp. 180–90 in *Wild Mammals in Captivity: Principles and Techniques*, edited by Devra G. Kleiman, Mary E. Allen, Katerina V. Thompson, and Susan Lumpkin. Chicago, IL: University of Chicago Press.
- Wilson, Edward O. 1984. *Biophilia*. Cambridge, MA: Harvard University Press.