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In Search of Eden — A Brief History of Great Ape Exhibits

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Abstract

Great Apes, among the world's most severely threatened species and our closest biological relatives, are being featured in new zoo exhibits of unprecedented size, complexity, cost and number throughout the country. Historically, Great Ape exhibits are categorized into four chronological and thematic phases:

PHASE I — Trophies and curiosities.

PHASE II — The Science Lab.

PHASE III — Great Apes in a small Eden.

PHASE IV — Great Ape societies in Eden.

Each phase represents not only the prevailing state of management, knowledge and technology but, more importantly, the public's attitudes toward wildlife and wilderness. Future designers of such facilities may benefit from a careful examination of the philosophical bias inherent in their own plans. How will future observers characterize our work?

This paper offers a detailed review of contemporary great ape exhibits and could be a valuable resource to future researchers.

Introduction

We are personally aware of 20 major Great Ape exhibits which have opened in the last two decades. There are probably several more. We are also aware of at least eight major new facilities currently under construction or in design. The amount of thought, energy and expense directed toward improving the exhibition and housing of Great Apes is without historic precedent. It is timely, therefore, to reflect for a moment on the history of Great Ape exhibits and the cultural attitudes that have influenced their design and development.

Interesting parallel developments appear to have occurred in the evolution of research facilities for Great Apes, but that history is beyond the scope of this paper. Readers seeking more detailed information about Great Ape facilities or about the role of habitat simulation in education are referred to the additional reading suggestions included at the end of this paper.

PHASE I — Souvenir Objects, Trophies and Curiosities

Although some wild species have been maintained in captivity since very early times, chimpanzees and orangutans were not displayed in Europe until the 18th Century (Maple, 1979), while gorillas were first exhibited in 1855 (Mallinson 1980).

Mallinson (1980) traces the arrival of a number of gorillas to Europe and the USA during the period 1855 - 1897, noting that nearly all of these animals died within a few months of their arrival. Improper diet and fatal contagious disease contracted from close contact with the public were the usual cause of death. These events led Hornaday (1915) to predict that gorillas would never successfully be maintained in captivity. Why were Great Apes captured and displayed when their chances for survival seemed so slight? The answer may lie in the temperament of the times.

The Victorian Era was characterized by tremendous colonial expansion by European powers. The colonialists brought home souvenirs of their conquests. These trophies included dramatic animal species, both dead and alive, which were displayed to an enthusiastic public in museums and zoos. While scientists saw great research value in the specimens, it is likely that most viewers considered them simply curiosities or triumphant spoils of a war against savagery. This attitude was heightened by exaggerated accounts from adventurers such as Paul du Chaillu (Mallinson 1980), who in describing the gorilla stated, "I can vouch that no description can exceed the horror of its appearance, the ferocity of its attack or the impish malignity of its nature." Such accounts from publicity-seeking adventurers made very popular reading in late 19th Century Europe.

Another popular practice which perpetuated mass misunderstanding of the Great Apes' true nature included the parading of young animals in costumes like bizarre children. This demeaning practice did provide necessary social interaction for the young animals, but also exposed them to contagious disease. Older unmanageable individuals were displayed behind bars, further enforcing the image of gorillas as felons or prisoners of war. The era of the chimpanzee tea party extended to recent times.

PHASE II — The Science Lab

Hediger (1950) wrote "The Modern Zoological Garden has something else to show... not the animal as an object any longer, but the animal as subject." Great developments in research and advances in public health occurred during the first half of the 20th Century. Advancing technology produced such materials as stainless steel, glass and a variety of disinfectants suitable for use in hospitals and biomedical research. Since early captive Great Apes quickly died of infectious disease it is not surprising that later gorillas were maintained in sterile surroundings, resembling operating rooms.

Close attention to hygiene and improvements in diet steadily improved primate longevity, and more and more zoos and research centers successfully maintained Great Apes, (Yerkes, 1925). However, there were no successful breeding of orangutans [until 1929] and gorillas [until 1956] (Maple and Hoff 1982). As a result, all captive Great Apes had to be imported from the wild, at great cost to wild populations. Harrison (1963) documented this tragedy.

"The last zoo collector permitted to operate legally in Sarawak in 1946 removed fourteen or more young orangs alive. To achieve this, we

know for certain that twenty others died as immediate consequence. At least twenty more were killed because the Dayaks thought that everybody could now help themselves once again. In the following year... no less than twelve illegally acquired oranges were confiscated."

Although zoos took great pride in their great apes and many became public celebrities, the animals were kept in very impoverished surroundings. They were usually kept indoors or, when allowed outside, were placed in unyielding concrete grottos. Should the animals want privacy from a jeering, jostling public or from each other they could not retreat to private quarters. Although they were "subjects" to researchers, they were still "objects" to the public, brooding beasts trapped in an aqua-colored laboratory. How little these exhibits tell us of the Great Apes' true nature and nobility.

PHASE III — Great Apes in a Small Eden

Although behavioral scientists such as Bingham and Nissen had reported information about Great Apes in the wild during the 1930s (Maple and Hoff, 1982) it was not until Schaller's *The Mountain Gorilla* was published just 24 years ago that zoo professionals and designers got their first detailed look at Great Ape ecology. Since then the work of Fossey (1983), Goodall (1968), Galdikas (1979) and other field biologists have contributed enormously to the information available about Great Ape ecology, diet and behavior. Significantly, National Geographic Society publications and films have produced wonderful color images of these creatures interacting in their natural habitats. These compelling images initiated a new era of Great Ape exhibits.

Outdoor Gorilla Exhibits

As early as 1896, R. L. Garner suggested keeping gorillas and chimpanzees in extensive outdoor environments resembling their original habitats. Yet it would take 80 years before a major zoo attempted this approach. The first great ape exhibit to consciously attempt to replicate a wild gorilla habitat opened in 1978 at Woodland Park Zoo in Seattle.

The designers had sought advice and received strong encouragement from Drs. Schaller, Fossey, Goodall and Galdikas and based their selection of plant materials on photographs in *National Geographic* magazine. This 400 m² exhibit was the first to incorporate successfully large areas of lush plantings with the gorillas' landscape, creating a small Eden for a troop of up to six individuals (Coe 1983). The exhibit landscape remains largely intact after 11 years of use.

Earlier gorilla exhibits at the San Diego Zoo (1965, 527 m²) and San Diego Wild Animal Park (1975, 1215 m²) had been larger but had not included any vegetation other than grass. The resulting areas were large but relatively impoverished in terms of behavioral opportunities for the gorillas. (The Wild Animal Park gorilla exhibit was planted with large trees in 1985.) Although these exhibits did little to create an image of a natural gorilla habitat, they encouraged other zoos to develop more naturalistic exhibits.

A large gorilla yard was opened at the San Francisco Zoo in 1980 (Martinez 1984). Like the Woodland Park exhibit it contained a number of large trees which in both cases eventually were damaged severely by the gorillas and had to be protected.

The San Francisco exhibit gained an area for the animals by utilizing walls rather than hidden dry moats to enclose the gorillas. The resulting exhibit contains 3000 m², but positions visitors directly above the gorillas. Visitors are compelled to look down on the animals, which puts the gorillas in a psychologically inferior position to human spectators (Coe 1985).

The Jersey Wildlife Preservation Trust Gorilla Exhibit (Mallinson 1980) and the Audubon Zoo Gorilla Exhibit seem to be intermediate in style between the Woodland Park Zoo and San Francisco Zoo

models. The Jersey exhibit contains 1950 m² and uses complex topography to enrich the habitat. The smaller Audubon Zoo Exhibit provides a very attractive setting but must rely on substantial amounts of background rockwork, a feature not abundant in wild gorilla habitats. Like the Seattle example, the San Francisco, Audubon and Jersey exhibits attempt to landscape the public side of the barrier in order to minimize the visual barrier between humans and gorillas. Lush planting of visitor areas had earlier been achieved at the Cincinnati Zoo Gorilla Exhibit but the gorilla's area, except for a small amount of protected planting, resembles a more conventional grotto exhibit.

In 1985, the Philadelphia Zoo opened three adjacent exhibits for gorillas, orangutans and gibbons, and mandrills modeled on the Woodland Park Gorilla Exhibit. The area has been landscaped to create a very attractive park-like setting and makes extensive use of shallow water moats reinforced with electrified wires. The gorilla area is about 460 m² and orangutans about 405 m².

The gorilla exhibit at Howletts, U.K., marked a considerable departure from the wilderness or park-like settings of the gorilla exhibits previously described. It is essentially a large, well-furnished outdoor cage containing up to 24 gorillas. A very similar exhibit was built at the Columbus Zoo in 1985 (160 m²) with a smaller version opened at the Pittsburgh Zoo in 1986. An advantage of such enclosures is that they give the animals total access to the available space and provide the widest possible range of activities and positions. A disadvantage is that they present the gorillas to the public in a cage-like, human-dominated environment.

Indoor Gorilla Exhibits

The Basel Zoo Great Ape House included a tropical planting area behind the welded mesh barrier at the rear of an otherwise conventional laboratory-like enclosure. This was perhaps the first serious attempt to create an indoor Eden for Great Apes. A similar approach was later adapted at the Krefeld Zoo (Vogt 1977), the Lincoln Park Zoo (1977) and National Zoo (1981).

The Lincoln Park facility is a particularly noteworthy reference point in the development of indoor exhibits. Like the Howletts facility it strives to be utilitarian rather than naturalistic and to provide its primate inhabitants the widest possible range of choices and activities under nearly ideal management conditions (D. Merritt, pers. comm.). The exhibits are about 15m high and are furnished with an array of steel pipe poles, platforms and woven rope cables as well as two levels of visitor viewing. Although the walls and floors are "hard" and synthetic, the rooms are spacious, lofty, well lit and irregular in shape. The exhibits presently contain 25 gorillas, 9 chimpanzees and 5 orangutans. The Lincoln Park facility appears to be a very logical and successful outgrowth of the technological, laboratory-type approach advanced by recent knowledge of Great Ape behavior.

In contrast, the new facilities at the Brookfield Zoo (1981), Como Park Zoo (1986) and St. Louis Zoo (1987) attempt to artificially re-create tropical forest floor habitats for their Great Apes. This approach was pioneered in a big way at the Tropic World complex at the Brookfield Zoo. While artificial trees are typically hard and inflexible, however, the technology of artificial tree construction is developing very rapidly. Thus, a new generation of more flexible artificial limbs strong enough even for Great Apes is a likely reality.

Chimpanzee Exhibits

In the 1960s Holloman Air Force Base in New Mexico built a 10 ha chimpanzee enclosure (de Waal, 1982). In 1971, the Burger's Zoo in Arnhem, Netherlands, opened a 70,000 m² enclosure modeled somewhat after the Holloman example, but providing separation for animals at feeding time. de Waal (1982) and Van Hoot (1978) describe the exhibit in detail, noting that by 1981, 25 chimpanzees lived together there. The area is well shaded by trees (most of which are protected) and provides a diverse and interesting habitat for the chimps, though it resembles a park more than a wilderness.

One important feature of the Arnhem exhibit is its use of an extensive water moat (Van Hoot, 1978). Water moats had been used at Holloman Air Force Base, Chester Zoo in the U.K., Ibaclan Zoo in Nigeria (Golding, 1972) and Bronx Zoo among others, sometimes with disastrous results when Great Apes drowned (Brown et al 1982). However, other gorillas at the St. Louis Zoo, Twycross Zoo and Audubon Zoo have enjoyed access to shallow water which may be utilized as a habitat enrichment device (Maple, 1982).

The Taronga Zoo in Sydney, Australia opened its chimpanzee park in 1980. This facility features a 1620 m² outdoor exhibit enclosed by a water moat along the front and masonry walls along the sides and rear. Twenty chimpanzees are housed here. Enrichment features include dead climbing trees and artificial termite mounds from which the animals can probe for treats.

In the United States large chimpanzee exhibits have been constructed at the Washington Park Zoo in Portland, Oregon (648 m²) and the North Carolina Zoological Gardens in Asheboro, N.C. The North Carolina exhibit encompasses 3000 m² and contains nine animals. It is one of the most naturalistic of all zoo Great Ape exhibits and features an artificial termite mound which the chimpanzees can probe for treats. This realistic version of the artificial termite mounds predates the devices described in 1978 by Yoshihara and Shimahara (D. Holland pers. comm.).

Orangutan Exhibits

Orangutans seem to do more damage to exhibit furnishings than either gorillas or chimpanzees. It is probably for this reason that orangutans have not been exhibited as well as the other Great Apes to date (Maple, 1980). The most successful exhibits would include Chicago's Lincoln Park Zoo and the San Diego Zoo. Both share a strong vertical emphasis, although the Lincoln Park exhibit is indoor and "hard." The San Diego exhibit (1983) has an outdoor, moated enclosure containing massive wood piles and heavy rope cables tightly anchored to the ground.

In the Philadelphia Zoo's new orangutan exhibit the orangs share their habitat with gibbons and reside in a naturally wooded area. The orangutans have just begun to utilize their outdoor area so their responses to this new habitat have not been fully documented.

PHASE IV —Great Ape Societies in Eden

The best of contemporary exhibits allow a wide range of social interaction encouraged by reasonably naturalistic contexts. Certainly enormous progress has been made beyond the remaining zoo apes kept in solitary confinement. While we strive to enhance these conditions, what new breakthroughs can we expect? Again, we turn to the data generated from observations of free-living Great Apes. Work at Gombe National Park (Goodall, 1968) shows the complexity of large chimpanzee societies. The Arnhem exhibit with a troop of 25 chimpanzees (de Waal, 1982) approaches these conditions and provides, in a sense, a look into the future.

Fossey (1983) described the vociferous and sometimes violent interactions which occurred when two mountain gorilla troops meet, and explained the silverback males' remarkable size and strength in terms of his competition with other males. Relying upon these vivid observations for inspiration, Zoo Atlanta is presently building five large adjacent outdoor gorilla habitats. Each has an elevated position from which silverbacks can safely display at one another (Coe & Maple, 1984). The entire troops would join in these displays. Such inter-troop exhibits allow silverback males to perform their chief occupation, "protecting" their families. The night quarters and transfer accommodations are arranged so that a troop may use a different outdoor area each day, as if traveling through its natural range.

This will also permit them to see and interact with different neighboring silverbacks and troops

on varying days, again simulating the natural model.

The outdoor habitats will be lushly planted and, although most fragile plantings will be protected, the gorillas will be allowed to "harvest" some areas on a rotational basis.

The exhibits under construction include a public viewing zone designed to resemble a scientific field station where visitors will be able to record "scientific observations" and play games emphasizing the importance of field research and habitat conservation.

The Zoo Atlanta gorilla exhibits are part of a greater habitat zone designed to re-create the feeling of visiting a National Park in Cameroon, West Africa, an area from which gorillas have been nearly extirpated. Other exhibits within this zone include West African tropical forest birds, mandrills, guenons and duikers.

The Yerkes Regional Primate Center of Emory University, which is contributing at least 14 gorillas to the project, is helping to design innovations to the night quarters to allow routine non-invasive testing of the animals. Thus, the facility will function as a major research center as well as an advanced public display.

Farther along the visitor pathway are three orangutan exhibits. In the center is an area for females and youngsters. On both sides are smaller areas for solitary males so sited that the males can display at each other and at the females, simulating a typical condition in wild orangutan societies. Nearby will be exhibits of gibbons, hornbills and tapirs, all simulating conditions in Ketambe National Park in northern Sumatra, Indonesia. These thematically and contextually interrelated exhibits at Zoo Atlanta encompass an area of 11,446 m². Individual outdoor animal's areas range from 2636 m² to 360 m².

Zoos in Dallas, Milwaukee, Denver and Oklahoma City are in the planning stages of Great Ape exhibits. The Dallas gorilla exhibit will include two habitat areas of about 3900 m² each. There will also be a simulated field station from which visitors can gain insights into gorilla behavior and conservation. The Denver facility will also have two large outdoor habitats and will include a simulated native village as the focus of the public areas.

Detroit Zoo is in the design phase of a large chimpanzee exhibit with animal areas totaling 700 m². This facility will be similar in area and troop size to the Arnhem exhibit but, like the North Carolina example, will be much wilder in appearance. Like the previously described gorilla exhibits it will also feature more thematic and interpretive development in the public viewing areas than previous chimpanzee exhibits have shown.

This paper began with the premise that Great Ape exhibits mirror society's attitudes toward wilderness in general and Great Apes in particular. What will these most recent exhibits, these Great Ape societies in Eden, say about our contemporary cultural attitudes? The popular dissemination of beautifully illustrated wildlife magazines and nature films have created a far greater public awareness of wild animals as a part of wild, exotic places.

Wildlife tours and safaris have never been more popular, nor have once remote wilderness areas ever been more accessible. The idea of the zoo as a place where inexpensive "mini-safaris" are available within a few minutes drive of home is a logical outgrowth of this trend. Other examples of reacting to and reinforcing this trend include feature films such as the "Indiana Jones" series and "Out of Africa," and the popularity of "Banana Republic" and similar merchandising efforts.

How will future observers characterize our work? They may well wonder why previous generations of well-meaning zoo professionals tolerated over 100 years of sterile enclosure and relative isolation of Great Apes from con-specifics. On the other hand, future historians undoubtedly will consider the 1970s and 1980s as major turning points, where the first conceptions of human-created

Edens for Great Apes were realized and the maintenance of expatriate Great Ape societies were possible. Hopefully, they will see this period not as a culmination of what came before but as the wellspring of far better things to come.

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