

PHILADELPHIA ZOOLOGICAL GARDENS
3400 West Girard Avenue
Fairmount Park
Philadelphia
Philadelphia County
Pennsylvania

HABS No. PA-6211

HABS
PA
51-PHILA,
750-

WRITTEN HISTORICAL & DESCRIPTIVE DATA

HISTORIC AMERICAN BUILDINGS SURVEY
National Park Service
U.S. Department of Interior
1849 C Street, NW
Washington D.C. 20240

ADDENDUM TO:
PHILADELPHIA ZOOLOGICAL GARDENS
(Philadelphia Zoo)
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PHOTOGRAPHS

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PHILADELPHIA ZOOLOGICAL GARDENS

HABS NO. PA-6211

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Location: 3400 West Girard Avenue, Philadelphia County, Philadelphia, Pennsylvania. The Philadelphia Zoological Gardens, commonly referred to as the Philadelphia Zoo, occupies forty-two acres near the west bank of the Schuylkill River within Philadelphia's Fairmount Park. The kidney-shaped property is bordered to the north by Girard Avenue, to the east by 34th Street, and to the south and west by Zoological Drive which follows the contours of the railroad lines located immediately to its east.

Present Owner: The Zoological Society of Philadelphia is a private corporation that operates the zoo on property owned by the city of Philadelphia.

Significance: The Zoological Society of Philadelphia was incorporated in 1859, making it the oldest organization of its kind in the United States. It opened its garden to the public on July 1, 1874. The grounds have undergone constant change and renovation over the last 120 years as the zoo adopts more progressive designs. Nevertheless, the contemporary landscape is a revealing document of zoo history, of the nineteenth-century American park movement, and of colonial Philadelphia.

Present within its confines are an eighteenth-century house built by John Penn, grandson to Pennsylvania's founder, William Penn; rustic architecture and landscape features from the original nineteenth-century design scheme by Hermann Joseph Schwarzmann, engineer of the Fairmount Park Commission and architect of the Philadelphia Centennial Exposition of 1876; and animal quarters dating from the 1870s to the 1990s by many of Philadelphia's most influential architects including Frank Furness, George Hewitt, Paul Cret, and Robert Venturi.

The zoo contains a living record not only of the fauna of the world but of the evolution of American's perceptions of nature. The buildings, like the landscape, record the evolution of zoo design and the concomitant changing attitudes towards wildlife.

Historian: Cynthia Ott, HABS Historian, summer 1996

Part I: HISTORICAL CONTEXT

History of Zoological gardens and Menageries

Humans' curiosity and exhibition of wild animals are as ancient as the species' co-habitation. Distinctions are frequently made in zoo literature between menageries and zoological gardens, that is, animal collections used as sources of spectacle and entertainment verses as sources of scientific inquiry and education. However, the boundary between the two entities is not always so clear.¹ Meanings and interpretations overlap in ancient and modern exhibitions. Rather than attempting to delineate a simple evolution of zoological display, various historic examples are discussed in order to provide a context for the inception and development of the Philadelphia Zoo.

While few accounts remain of small private collections of wild animals from antiquity, the existence of large imperial menageries was recorded by Egyptians in the Third Century, B.C., by Chinese in the First Century, B.C., and by many other ancient royal courts around the world. The animals were paraded before public and private audiences, taught to perform tricks, and, in some cases, free to roam the halls and gardens of their palace homes. They might be revered for their mystical qualities or used as allegories for the power and influence of their royal captors. These ulterior motives for display did not always negate genuine intellectual curiosity. The study of animals along with the pageantry is documented in many cultures.²

The Roman Empire (100 B.C.-500 A.D.) probably has the most notorious reputation for the treatment of wild animals. Gladiatorial contests staged in "circuses" pitted animals against each other and against men, leading thousands from both groups to slaughter. Besides these gruesome arena contests, animals were also peacefully kept by wealthy Romans in their country villas.

In the Middle Ages, members of the feudal aristocracy continued these traditions. The expansion of global explorations in the fifteenth to eighteenth centuries fostered an escalated interest in collecting. Merchants and sea captains frequently returned from excursions abroad with exotic flora and fauna for their monarchs and their own private estates. Besides deer parks for hunting, gardens were set aside that included bear pits, aviaries, and lion houses to keep exotic species delivered from

¹ According to the Oxford English Dictionary, the term "zoo" was first used in 1847 to signify the London Zoological Gardens.

² See the general zoo histories cited in the bibliography for historical references.

around the world.

Andre Le Notre's design for Versailles in the 1660s included a series of animal cages and pens placed in a radial pattern within the formal gardens. Tree-lined paths were provided so that guests could amble through the collections. At other sites, pavilions, or follies, were erected so that royalty could even dine amongst the elephants, giraffes, and ostriches. Other facilities were not so benign. Generations of English monarchs kept their menageries within dank cells and crates at the Tower of London.

The exotic animals used to embellish palace grounds frequently became the basis for public collections. In France, after the Revolution in 1789, the animals became public property and were transferred to the Jardin des Plantes, a botanical garden established in 1626. In Austria, the Schonbrunn Zoo built by Francis I was open to the public in 1765.

Although the Zoological Society of London's gardens were placed on royal grounds in Regents Park in 1828, its mission was much more than the enhancement of a monarch's reputation. Like the Jardin des Plantes, the Zoological Society of London was an organization devoted to the Enlightenment ideas of empirical observation, the classification and ordering of species as proposed by Linneaus, and the general proliferation of knowledge. The London Zoo's founders, Sir Thomas Stamford Raffles, 1781-1826, and Sir Humphrey Davy, President of the Royal Society of London from 1820 to 1829, envisioned the institution to be a laboratory "bearing the same relations to zoology as a science that the horticultural society does to botany."³

Besides the London Zoo, twenty-five zoological societies were established around the world from 1826 to 1865.⁴ They all tried to philosophically distance themselves from traveling circuses and menageries that highlighted human bravado and dominance over the animals, especially through performing acts. Someone campaigning for support for the newly-found Zoological Society of Philadelphia contrasted "the wretched, cooped up howling and evidently ill at ease beasts which are yearly exhibited in our traveling menageries...[with] the beautiful scene presented by a

³ Letter from Raffles to his cousin Thomas Raffles, 1825 as quoted in Philip Street, The London Zoo (London: Odhams, 1952), p. 13.

⁴ James Fisher, Zoos of the World: The Story of Animals in Captivity (Garden City, NY: The Natural History Press, 1967), p. 52.

well-appointed Zoological Garden."⁵ However, despite the disclaimers made by zoo organizers, the links between the two enterprises were probably stronger than they were willing to admit.

Like the menageries, early zoological gardens were designed more for the comfort and pleasure of the human visitors than for the animal inhabitants. Common to both groups was the method of enclosing animals in small all-purpose metal cages, and the incorporation of musical concerts, eateries, and other side attractions into their programs. The London Zoo's sale of Jumbo the Elephant to P.T. Barnum in 1881 perhaps illuminates the relationship and similarities between the two institutions. Proper distinctions were yet to be made regarding appropriate animal treatment, and the value of pure amusement without the added benefits of scientific study.

Traveling menageries began touring in American in the 1700s. By the turn of the century, hundreds of bands of "traveling museums" entertained populations up and down the east coast.⁶ Some menageries became side-shows to circus acts, and eventually, performing big cats and elephants were part of the main show. Others, like the one described in Little Charley's Visit to the Menagerie, 1855, provided educational details about the animals' habitat, habits, and country of origin.⁷

In 1835, the Zoological Institute was organized by a coalition of menagerie owners as a leasing agency and regulator of the import of exotic animals. Its collections were housed in New York City. Philadelphia had a similar zoological institute located at Cooke's Circus Building at Ninth and Chestnut Street in 1839. A year later it moved to Eighth and Sansom Streets and became part of the Raymond and Waring Circus where it remained until 1848. The building was not only used as a way-station for animals, but also as a winter headquarters and entertainment center for the traveling shows. There were also private collections within the city. For example, in 1762, Archibald McCall, an India merchant living in Philadelphia, "stocked [his yard] with various animals

⁵ "C.W.," North American and Gazette, March 15, 1860.

⁶ For information about early menageries and circuses in the United States see Tom Ogden, Two Hundred Years of the American Circus: From Aba-Daba to the Zoppe-Zavatta Troupe (New York: Facts on File, 1993).

⁷ Little Charley's Visit to the Menagerie (Boston: Brown, Bazin & Co, 1855).

brought by his supercargoes from foreign parts...."⁸

Charles Willson Peale had one of the most well-publicized animal collections in town. Peale kept caged animals in the State House Yard as part of his museum collection from 1794 until 1854. Monkeys, elks, bears, wild cats, and a bald eagle were exhibited in the garden. The living animals complimented his extensive collection of preserved species, geological specimens, and cultural artifacts displayed next door at the American Philosophical Society at Fifth and Chestnut. At their death, many of the animals became part of the permanent indoor exhibition.

The Peale Museum was one of the first natural history museums in the country. Its slogan, "The Birds and Beasts will teach thee," might have been an inspiration to William Camac and the other American founders of zoological gardens. Between 1858 and 1900, twelve zoos were established in the United States. Philadelphia was the first zoological society formed but the Central Park Zoo in New York City opened its gates in 1864, ten years before Philadelphia opened theirs. However, because the Central Park Zoo initially operated as a boarding house for menagerie owners, and because the Philadelphia Zoo had scientific and educational goals from its inception, it is considered the first zoo in the United States. Among the other cities with zoos created prior to the turn of the century are Chicago (1870), Baltimore (1876), Cincinnati (1875), Washington, D.C. (1890), and New York's Bronx (1899).⁹

Like Peale's Museum and other scientific societies, zoological gardens had lofty rather than prosaic goals. According to the annual report of 1875, "It is the aim of the Managers, not only to afford the public an agreeable rational recreation, but by the extent of their collection, to furnish the greatest facilities for scientific observation."¹⁰ President Camac wrote Professor Joseph Leidy, a prominent Philadelphia scientist, in 1876 asking him to participate in a "course of public lectures by gentlemen eminent for their knowledge of natural history" being organized

⁸ Townsend Ward, "South Second Street and Its Associations," volume 4, The Pennsylvania Magazine of History and Biography (Philadelphia: Historical Society of Pennsylvania, 1880), p. 48.

⁹ See Fisher, "Appendix: List of Zoos and Aquariums," pp. 236-245.

¹⁰ Third Annual Report, 1875.

in order to give the society "a more scientific character."¹¹

The relatively free and open exchange of information regarding animals and their care are common throughout American zoos' history. Organizations, such as the American Association of Zoological Parks and Aquariums (f.1924), were formed to facilitate this dialogue through publications and conferences. Over years of operation, zoo staffs gained an increased understanding of how to house and sustain captured wild animals. As the pitfalls of ornamental buildings were recognized, zoo landscapes and architecture were adapted to fit the needs of the animal inhabitants, the keepers, and the visitors. New quarters were created so that the animals were healthier and more content and the visiting public had greater access and understanding of the animals' natural habits.

Initial changes in the physical plan, as demonstrated by the Philadelphia Zoo, usually entailed the creation of more open-air pens and the addition of adjustable skylights in buildings to improve ventilation. These adaptations, in part, reflect Victorian fixations on the health benefits of fresh air and the threat of germs and diseases existing in enclosed spaces. However, disdain for the poorly-treated animals was also expressed. In 1902, the Philadelphia Zoo received a letter from a bereaved member of the Women's Pennsylvania Society for the Prevention of Cruelty to Animals begging for the merciful killing of a confined and shackled elephant.¹²

One of the most important innovators in the field of animal handling and captivity was the German animal dealer and trainer, Carl Hagenbeck. In 1906, Hagenbeck opened Tierpark, a zoo in Stellingen near Hamberg, Germany which became the model for twentieth century zoos.¹³ The main ambitions propelling Hagenbeck's designs were the improved health, quality of life, and breeding habits of captive animals and the creation of more attractive and visceral exhibits for the viewing public. The balance between these priorities is debated by contemporary designers and planners.

¹¹ Letter to Joseph Leidy from William Camac, November 24, 1876, Misc. Collection 1B, Joseph Leidy Collection, Academy of Natural Sciences, Philadelphia, PA.

¹² Letter from Caroline Earle White to Arthur Brown, October 11, 1902. Philadelphia Zoo Archives.

¹³ Hagenbeck also created one of his naturalistic exhibits at the 1904 St. Louis World's Fair. It contained a polar bear, walrus, and an Eskimo. See Melissa Greene, "No Rms, Jungle Vu," The Atlantic Monthly, December 1987.

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At Tierpark, Hagenbeck replaced iron cages and generic paddocks with barless outdoor grottos where animals roamed in microcosms of their natural habitats. Dry or water-filled moats, often camouflaged by shrubbery, prevented escape and permitted panoramic and unobstructed views of the animals. Artificial rocks and mountains constructed from reinforced concrete concealed animals' indoor quarters and provided majestic backdrops for the exhibits. The enclosures also contained naturalistic pools and vegetation. The use of plants as shelter, camouflage, and nesting dens within indoor and outdoor exhibition spaces transformed their functions from mere decorative accessories to vital utilitarian components of zoo landscapes.

Despite the success of the displays, they were not mainstream attractions at zoos for another thirty years. The London Zoo was one of the first to respond to Hagenbeck's innovations by constructing Mappin Terrace, an outdoor grotto for bears, deer, and other animals, in 1913. The Philadelphia Zoo's first attempts at naturalistic habitats are the small reptile garden built in 1930, and the pachyderm house and grottos built by Paul Cret eleven years later.

In the twentieth century, zoo architecture continues to reflect popular contemporary designs and scientific advances. In reaction to the horrific conditions of ornamental structures, buildings in the first half of the twentieth century were designed especially for ease of maintenance. Tile floors and walls replaced wooden ones so that germs, dirt, and odors could be easily washed away with high pressure hoses.

The architecture also reflected advances in veterinary science. For example, in 1931, the Philadelphia Zoo placed plate glass in front of primates' enclosures which successfully prevented the spread of tuberculosis from the public. With the employment of professionally trained zoologists, veterinarians, and animal keepers, progress was made in animal nutrition, reproductive biology, diseases, and psychology. When animal rights activists question not only the care and treatment of confined animals but the very existence of zoos, zoo personnel often justify their continuance on the basis of this scientific work.

While many zoos still measure their success by the diversity and the number of animals in their parks, survival and breeding rates have become much more meaningful ways to gauge achievement. Many zoos, including Philadelphia, participate in captive breeding programs in order to propagate rare and endangered species. Zoos are now reserve banks, or "arks," for rare animals as wildlife populations are increasingly threatened with encroachment and extinction. Today, approximately eighty per cent of zoo populations are born in captivity. Measures are even being taken to stem the overpopulation of some captive breeds.

These scientific and preservation goals are delicately balanced with the desire to educate and entertain the masses. Lectures, classroom programs, explanatory exhibit labels, and modern multimedia and interactive facilities are used to enhance the public's awareness and understanding of animals and plants, and humans' relationship to them. "Dignified showmanship" of animals, including performing acts and anthropomorphic displays, is no longer recognized as an appropriate adjunct to zoo attractions as they were thirty years ago. However, children's zoos, with their hands-on approach to teaching youngsters to respect and care for animals continue to be vital additions to zoo grounds since their inception in the 1930s.

Because of the proliferation of scientific fieldwork on animals in the wild, the expansion of tourism, and the advent of wildlife television shows and movies in the 1960s, zoo professionals and the general public are more knowledgeable about animals' natural environments and behavior. Consequently, their expectations of zoo exhibits were radically altered. Hagenbeckian habitats are now considered naive and romantic attempts to mollify the viewing public, and inadequate for the animals' needs. And, the once ultramodern hygienic cages seem barren and inhumane as well as superfluous in an age of antibiotics.

Zoo exhibits were revolutionized in 1981 when David Hancocks, director of Woodland Park in Seattle, Washington, hired the landscape architectural firm of Jones and Jones instead of a conventional architectural firm to design a primate center. "I naturally rephrased the problem in my own mind," wrote Grant Jones, "as designing a landscape with gorillas in it."¹⁴ In consultation with the world renowned gorilla biologist, Dian Fossey, Hancocks and the design team developed "an international standard for the replication of wilderness in a zoo exhibit and for the art of including and engaging the zoo-goer."¹⁵

According to Jon Charles Coe, a landscape architect working for Jones and Jones at the time, the two main ideas driving their designs were "landscape simulation, in which the design tries to replicate the natural habitat of the animals, and landscape immersion, in which the people are led to believe they're physically in the same landscape as the animals, though separated by unseen barriers."¹⁶ Their objectives are to promote the

¹⁴ Greene, p. 67.

¹⁵ Ibid., p. 62.

¹⁶ Nels Nelson, "Habitats for Zoo-manity," Philadelphia Daily News, August 27, 1991.

physical and mental health of the animals and to teach respect for them by putting the viewer at a psychological disadvantage. Instead of museum-like displays where patrons need be no more than detached observers, these exhibits seek to elicit a sense of tension and of discovery. Reminiscent of nineteenth century picturesque park designs, visitors are led through the exhibit by winding narrow paths, never with a clear view of what lies ahead. Animals, rather than people, are made the focus of the exhibits by the creation of isolated viewing pockets where the number of animals always outnumbers the number of patrons visible in a given panorama.

Considerations regarding animals' social and territorial needs are reflected in the size of the exhibit, the type of vegetation planted, and the number of animals held in it. With horticulturists and landscape architects on the design team, the habitat serves as a viable, working landscape instead of just an attractive backdrop. Visitors seemingly are enveloped in this world by the projection of landscape features--such as artificial rock formations and vegetation--into their space instead of abruptly terminating at the animals' compound.

The new zoo exhibits also attempt to display the animals' natural behavior instead of presenting them as human-like oddities. However, the entertainment value of the exhibits is certainly not superfluous to their larger mission. These engaging and visceral attractions are strong competition against the hundreds of other amusement enterprises vying for patronage. Some zoos, including the Philadelphia Zoo, have also added theme park-like attractions, such as monorails, to entice patrons to their gates.

Just like public zoos, private menageries and roadside zoos also continued to thrive in the twentieth century. Safari Parks, large preserves in which animals roam free and patrons are confined to vehicles, have proliferated as adjuncts to theme parks. Wealthy eccentrics, such as William Randolph Hearst, the newspaper publisher, and Michael Jackson, the popular singer, created massive menageries on their California estates. Not all private establishments are bastions of abuse. Some are certified members of the A.A.Z.P.A.

Perhaps more severely than any other time in their history, zoos today are facing serious financial constraints as public subsidies are less and less accessible. However, zoos' survival has always been predicated on change and adaptation. Evidence of the zoo's modifications can be traced in their landscapes which are tangible records of scientific innovations, artistic trends, and, perhaps most importantly, evolving cultural perceptions of animals.

The Park Movement

The origins of the American Park Movement are based in the sweeping technological, economic, and social changes precipitated by industrialization in the nineteenth century. The positive aspects of modernization, such as job stability and technological advances, were matched by the negative aspects, such as pollution and overcrowding, and their related health and environmental problems. Many cities' resources were overtaxed by the influx of industry and humanity. In Philadelphia, the population was 80,000 in 1800 and by 1900 it had reached 1,300,000 people.¹⁷

The impetus for creating open green spaces within urban settings was generated by a desire to combat both the practical and social dimensions of these problems. Prior to the nineteenth century, urban parks in America consisted merely of small undeveloped areas within neighborhoods. William Penn's original design for Philadelphia included four open squares in the city's grid to serve as natural oases and community meeting places. However, these small plots were not large enough to relieve the urban blight. His desire to create a "greene country towne" was encroached on by unregulated urban development.

Most critically, the city needed to protect the water supply from industrial pollutants and from diseases, such as yellow fever. In 1844, the city began working towards these goals by purchasing Lemon Hill, a forty-five acre country estate located just above the Fairmount Waterworks to serve as a natural buffer to industry along the Schuylkill River. Eleven years later, the site was designated a public park and renamed Fairmount Park. In 1867, the Fairmount Park Commission was created to maintain and to extend city park land. After extensive purchases of property along the Schuylkill River and Wissahickon Creek in the late 1860s, Fairmount Park became, and still remains, the largest urban recreational park in the country.

The landscape designs for America's first urban parks were modelled after picturesque landscapes found on eighteenth century country estates, like Solitude; public parks in Europe, like London's Regents Park; and rural cemeteries, like Philadelphia's Laurel Hill, established in 1836. The park's variegated, natural landscapes were to serve as antidotes to the "clutter,

¹⁷ John Andrew Gallery, editor, Philadelphia Architecture: A Guide to the City (Philadelphia: Foundation for Architecture, 1994), p. 16 and 45.

corruption, and hectic pace of urban life."¹⁸ Influenced by the Romantic view of nature as a source of spiritual inspiration and solace, landscape designers, such as Andrew Jackson Downing and Frederick Law Olmsted, two of the most influential of all park designers, saw their work as a vehicle for social reform.

The undulating hillsides, meandering paths, groves of shade trees, grassy lawns, water features, and rustic buildings all combined to provide a natural haven for the recreation and rejuvenation of all classes of urbanites. As Downing stated in Rural Essays, "what an important influence these public resorts, of a rational and refined character, must exert in elevating the national character...."¹⁹ Steady incomes, new leisure time, and expanded transportation networks enhanced people's ability to use the parks.

Rather than simply a place of amusement and invigoration, the park was to be a place of educational opportunity. As a result, the less romantic and more Enlightenment-inspired concerns for the observation and ordering of nature were also found in parks. By introducing and labelling exotic plants, beauty and instruction were combined to create a didactic natural environment. However, rather than a Loudon-inspired Gardenesque landscape in which botanical varieties were displayed as single specimens, the norm was to produce a more naturalistic effect by combining and grouping plant types.

The Zoological Society of Philadelphia's goals to "promot[e] the health and education of all classes" conformed precisely with the aims of the Park Movement.²⁰ As one author noted in 1860, children "watch and feed the innocent animals, and gain for themselves years of health by copious draughts of the fresh air of heaven."²¹ A.J. Downing envisioned zoological gardens, "where thousands of old and young would find daily pleasure in studying natural history, illustrated by all the wildest and strangest of the globe," as a vital component of urban parks.

¹⁸ David Shi, The Simple Life: Plain Living and High Thinking in American Culture (New York: Oxford University Press, 1985), p. 176.

¹⁹ Andrew Jackson Downing, Rural Essays (New York: Da Capo Press, 1974), p. 146. Reprint of 1853 edition by Putnam Publishing Co of New York.

²⁰ Second Annual Report, 1874, p. 20.

²¹ C.W., North American, March 15, 1860.

Following the example set by the London Zoo in Regents Park, the first zoological gardens in America were designed as separate entities within larger urban parks. Despite Downing's endorsement, the zoo's artifice and amusements were thought by some to "mar the beauty" and the "calm and perfect" character of the park landscape.²² Even though they were frequently segregated, early zoo landscape designs reveal a much greater concern for the maintenance of contemporary park aesthetics than for the comfort and well-being of the animals. "One hardly looks for picturesqueness in a zoological garden, but he finds it here," stated Edward Strahan in A Century After.²³ Rustic and ornamental buildings and cages provided interesting amusements for the human visitors but cramped and stuffy quarters for the animal inhabitants. Although zoo grounds have evolved over the centuries, their original attraction "as a source of scientific education, as well as of instructive amusement" combined with their aesthetic appeal continue to make them "the most agreeable places of popular resort" in many American urban landscapes.²⁴

Conservation and Preservation

As early as the 1830s, George Catlin remarked on the need to protect America's wild nature from the stampede of settlement. In 1871, just three years before America's first zoo opened, Yellowstone, America's first national park, was created. The loss of wilderness areas in the nineteenth century, due to industrialization and, expanding population and urbanization, fostered a new appreciation of these ecosystems. Wilderness areas and wild animals were no longer viewed entirely as antagonistic to American progress but, rather, as advantageous.

Preservation and conservation programs were created in part as a response to the extinction of the passenger pigeon, and the near eradication of other animals, such as the American bison.²⁵ From their inception, zoos took an active role in these movements by

²² Fairmount Park Commission, Plan for the Improvement of Fairmount Park (Philadelphia, 1859), p. 14 and Charles Mulford Robinson, Modern Civic Art of The City Made Beautiful (New York: G.P. Putnam's Sons, The Knickerbocker Press, 1903), p. 348.

²³ Edward Strahan, A Century After: Picturesque Glimpses of Philadelphia and Pennsylvania, part 14, (Philadelphia, 1875), p. 326.

²⁴ John Ridgway, Jr., Secretary of the Zoological Society of Philadelphia, "Report," March 1, 1874, and Hulfish.

²⁵ The last surviving passenger pigeon died at the Cincinnati Zoo on September 1, 1914.

offering safe havens for breeds on the brink of annihilation. In the 1891 Annual Report, Philadelphia Zoo's President Arthur Brown wrote, "The attention of all institutions devoted to zoological pursuits is being directed more strongly each year to the almost unprecedented destruction of many of the more valuable and important animals of our native fauna, and to the need for immediate adoption of every means which can be employed to save them from complete extinction."²⁶

An example of zoos' early activism is demonstrated by the New York Zoological Society's formation of the American Bison Society in 1905, a coalition devoted to the preservation of this imperiled breed. As the stress of population growth on natural habitats intensified during the twentieth century, zoos expanded their activism. "This is the age of extinction," wrote one author in 1985, "the wild is disappearing, and the world's zoos have become its ark."²⁷ The International Species Information System and the Captive Breeding Specialist Group of the World are two of many contemporary organizations united in their efforts to save vanishing species by propagating them in captivity. Research in animal nutrition, behavior, and disease has led to the development of exhibits that are more conducive to breeding and other natural behavior. Zoos strive to prevent the illegal trade of animals though some, of course, are not without culpability themselves.

New exhibits and education programs also play important conservation functions by informing the public of their role in animal and habitat survival. "We're using zoos as a bridge to help people realize that the world--other species, environments, and cultures--is one community, that we're inextricably related," explained Richard Block, a program director at the World Wildlife Fund.²⁸ Iron cages "increased the sense of human separation and alienation from wild animals, that encourag[ed] feelings of superiority and unalterable indifference," stated the Stephen Kellert, who had written widely on American perceptions of animals.²⁹ On the other hand, the new naturalistic facilities

²⁶ 19th Annual Report, 1981.

²⁷ Rachael Migler, "It's All Happening at the Zoo," Philadelphia, December, 1985.

²⁸ Quoted in Jerry Howard, "State of the Ark: Are the New Zoos Here in Time to Save Vanishing Species?," The Walking Magazine, July/August 1989.

²⁹ Stephen R. Kellert, "The Educational Potential of the Zoo and Its Visitor," Philadelphia Zoo Review, vol. 3, no. 1, 1987, p. 9.

that "immerse" visitors in the animals' worlds are designed to incite feelings of respect and deference, and to encourage participation in activities to save them.

The value of zoos as conservation centers is not without opposition. Some believe the merit of their educational and species management programs is well-overstated. Yet, like most of zoos' endeavors, these programs are perennially evolving to meet changing perceptions of wild animals and changing expectations of their role as the animals' keepers.

PART II. HISTORICAL INFORMATION: PHILADELPHIA ZOOLOGICAL GARDENS

A. Physical History:

Summary

In 1858, Dr. William Camac, a prominent Philadelphian active in many scientific and social organizations, joined with thirty-five "of the wealthiest and most influential citizens," including Dr. John LeConte, a naturalist, and Dr. John Cassin, a well-known ornithologist, to establish a zoological garden similar to the ones that Camac had visited on his European tours.³⁰ The Zoological Society of Philadelphia, as the group identified itself, petitioned the Commonwealth of Pennsylvania for incorporation on February 16, 1859 and on March 21, 1859 their petition was granted.

The Zoo's charter stated that, "The object of this corporation shall be the purchase and collection of living wild and other animals, for the purpose of public exhibition at some suitable place in the City of Philadelphia, for the instruction and recreation of the people."³¹ More pragmatic considerations were also given, as this statement reveals, "Undoubtably (sic) many foreign animals, which are valuable in their own countries, might be acclimated in ours, and thus become useful to us, or might enable us, by crossing, to improve the breeds which already exist

³⁰ "Sidney & Adams's Plan of Fairmount Park," April 9, 1859. According to Ronald T. Reuther, in "Philadelphia Zoological Garden," Zool. Garten N.F., Jena 45 (1975) 2, Camac was a member of the Franklin Institute, the Academy of Fine Arts, and the Horticultural Society. He was also director of the Academy of Music and a member of the committee for the Consolidation of Philadelphia in 1855.

³¹ "Charter and By-Laws of the Zoological Society of Philadelphia," in The Second Annual Report of the Board of Managers of the Zoological Society of Philadelphia (Philadelphia: King & Baird Printers, 1874).

here. The first steps towards this must be an acquaintance with the habits of the animals, such as could only be obtained in a well regulated zoological garden."³² The charter also contained the caveats that no liquor was to be permitted on zoo grounds and that "animals shall not be disturbed for the purpose of entertaining spectators."³³

According to the Plan for the Improvement of Fairmount Park, 1859, the zoo was originally intended to be located on the east side of the Schuylkill River at the north end of Landing Avenue. The site was near Lemon Hill, the first of many eighteenth-century estates purchased by the city for use as a public recreation area under the auspices of Fairmount Park. The Sidney and Adams plan for Fairmount Park which was accepted by the City Council in 1859 situates the zoological garden at this location (see Figure #1). Due to delays usually attributed to the Civil War and to apathetic Philadelphia citizenry, plans for the zoo lay dormant until March, 1872 when eight of the original thirty-six members of the society reorganized. During these interim years, the Fairmount Park Commission was formally established by an Act of Assembly and was making extensive purchases of land along both sides of the Schuylkill River and Wissahickon Creek.

Because the original 1859 location for the zoo was deemed inadequate for its purposes and since more park land was available, in June, 1873, the Commissioners of Fairmount Park granted the society "permission to occupy and enjoy the use and possession of a certain tract of land (measuring thirty-three acres) situated on the west side of the Schuylkill River within the boundaries of Fairmount Park."³⁴ On opening day July 1, 1874, only a third of the grounds, including those encompassing Penn's mansion, were enclosed as an exhibition space.

While extensive renovations occurred within the zoo grounds over the next decades, the outer boundaries have not changed

³² "The Zoological Garden," The Daily News, May 5, 1860. Scrapbook, Fairmount Park Commission archives, Philadelphia, PA.

³³ Charter and by-laws, 1874. This statement was probably included in response to the perceived mistreatment of animals in menageries and circuses.

³⁴ According to a letter by Mr. J. Vaughan Merrick, one of the first society members, the original board never seriously considered the Lemon Hill location. Merrick's letter was written in response to Mr. Arthur E. Brown's, Zoo superintendent, article about the founding of the zoo for the Philadelphia Public Ledger on September 4, 1903. The letter and article are located in the Philadelphia Zoo Archives.

dramatically. In 1903, a narrow strip of land at the northwest boundary was pared away during the realignment of Zoological Drive.³⁵ In 1913, Charles Penrose, the Zoo's superintendent, requested and received from the Fairmount Park Commission an additional nine-acre strip of land bordering 34th Street from the north gate south to the bridge over the railroad tracks. The Pennsylvania Railroad received a small parcel of land at the southeast corner in the 1920s in exchange for financing the development of this section. No further changes were made to the periphery of the zoo grounds.

Pre-Zoo Landscape

Nearly all of the zoo's forty-two acres were once a part of a three hundred acre tract of land patented to William Warner by William Penn in 1702.³⁶ When the Warner family began selling their property in the late eighteenth century, most of the land along the Schuylkill River had been cleared for the cultivation of wheat and other field crops. Scattered amongst these working farms were country estates owned by prosperous merchants and other wealthy gentlemen who wished to escape the congestion of the city and to emulate the customs of British aristocracy.

Among this later class was John Penn who came to Philadelphia from London in 1783. One year after his arrival, he purchased fifteen acres from the Warners and called the property "Solitude" after a manor in Germany. As a plan of Solitude reveals, it possessed all the elements of an English romantic-style country estate made fashionable by Lancelot "Capability" Brown and Sir Humphrey Repton. It featured the natural elements of forest, water, and meadow in combination with formal gardens to produce a varied and irregular landscape. The Georgian-style 29' x 29' manor house sat atop a ridge with an unobstructed view of the river below. Formal flower and vegetable gardens were juxtaposed to woods and orchards which in turn faced vast lawns and a "bowling green." A "wilderness" area directly west of the dwelling house was cut by curving foot paths. A narrow stream running west-to-east through the grounds from a natural spring provided the essential water feature for this picturesque landscape.

Penn returned to England in 1788 so Solitude was his residence for only four years. At the time of his death in 1834, much of the landscape along the Schuylkill was transformed into smaller

³⁵ Thirty-second Annual Report, 1904.

³⁶ The southern tip was part of patent to William Smith by Penn. In the brief of title to the J.B. Ferree land, it is referred to as "Mantua Farms."

farms, manufacturing centers, and transportation networks. In the 1850s, the western-most acre of Solitude was sold by Penn's descendants to local railroad companies and laid with tracks. The railroad tracks generally followed the route of Lancaster Pike, an important road that linked Philadelphia to its agricultural hinterland.

Three eighteenth-century maps for this region indicate the presence of a road that ran relatively parallel to the river, separated the western third of the Penn estate, and probably connected with Lancaster Pike. (See Figure #2) Historically referred to as River Road, Hutchinson Road, and 37th Street, it became the western boundary of the zoo property and was renamed Zoological Drive by 1904. While the road's contour remains the same, a comparison of maps suggests that it might have been moved closer to the railroad tracks once the zoo was established.³⁷

Although a map of the city that accompanied the Report of the Committee on Plans and Improvements of the Commissioners of Fairmount Park Upon the Extension of the Park shows the area fully divided into a grid of city streets in 1867, the urban scheme was never completely realized due to the area's incorporation into Fairmount Park. However, Girard Avenue, Eggesfield Avenue, Poplar Street, 35th Street, and 37th Street were laid across the region north of Solitude. Since only a single owner or renter occupied each one-and-a-half to three acre rectangular lot, the surroundings still probably maintained their rural atmosphere. As part of its expansive drive to buy land along the river for incorporation into the park, in 1868, the city of Philadelphia bought all eight properties in the area that now constitutes the zoo. Besides the fourteen acres owned by the Penn family, there were properties owned by Edward Evans (2.4 acres), Cold Spring Ice Company (2.1 acres), J.B. Ferree (two lots of 2.17 and 1.44 acres each), Samuel Powell (2.59 acres), George Powell (2.59 acres), Ellis Yarnall estate (18.43 acres), and the West Philadelphia Waterworks (ca. 1.5 acres).³⁸

While remnants of Solitude's picturesque landscape are difficult to discern on nineteenth century images, the ground's thick cover of trees contrasts sharply with the open terrain of the

³⁷ There are discrepancies between pre-1874 maps regarding the existence of other roads through the future zoo grounds for which Schwarzmann may or may not have used as guides to the walkways through the zoo.

³⁸ The briefs of titles for all of the properties are located in the title papers, Fairmount Park records, City Archives, Philadelphia, PA. Also see, "Map of Farms & Lots Within Fairmount Park, 1868."

neighboring countryside. (see Figure #3) A group of City Council members visiting the estate in the summer of 1860 referred to it as "a beautiful grove" that would make an impressive addition to Fairmount Park.³⁹

An 1850s photograph of the south central portion of the pre-zoo property portrays a landscape devoid of trees except for a few sparse plantings near the newly built waterworks and the dense covering on Solitude just to the north. Another image from 1875 reveals the thickness of Solitude's forest canopy. On the northern boundary of Solitude, a row of trees planted in an east-west line is clearly discernible on nineteenth maps but absent on all twentieth century renderings. The trees might have once been a part of the larger forest or served as a property marker. The house, kitchen, and coach house are also visible on pre-zoo images.

The Yarnall estate, called "Spring Hill," was located just south of Solitude. A long series of owners occupied the property since William Penn deeded it to the Warner family at the turn of the eighteenth century.⁴⁰ After Ellis Yarnall's death in 1847, the property was divided into smaller farms under separate leases before being sold in total to the city. The Yarnall mansion, "a brick building," is depicted on early plans for the zoo and the 1870 topographical map.⁴¹ Though the scheme was never realized, the house was going to be "surrounded with wide piazzas and with French roofs," and converted into a restaurant.⁴² The building's footprint appears to the southeast of the lake on the 1875 zoo plan but disappears on the plan of 1878.

A creek running approximately parallel to the one at Solitude and located near the southern border of the Yarnall estate is present on maps dated up until 1875 and is absent on those dated after 1878 suggesting that it was filled in by the Zoo builders. Only a few of the once abundant trees were standing when the Zoo received the property. Trees are usually depicted near the house and along the creek bed.

³⁹ "A Visit to Fairmount by Councils," Daily News, June 22, 1860.

⁴⁰ The brief of title is filed with the Spring Hill folder at the Fairmount Park Commission, Memorial Park, Philadelphia, PA.

⁴¹ The house is described as such on C.H. Miller's "Plan for the Improvement of the Zoological Garden," ca. 1880, hanging in the front hall of Solitude.

⁴² The Second Annual Report, 1874, p. 14.

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The pre-zoo grounds also contained industry. There was an ice house and coal yard on the southern Ferree property and another ice house owned by the Cold Spring Ice Company located just below Girard Avenue to the north. Most imposing of all was the West Philadelphia (or Twenty-Fourth Ward) Waterworks located on land once a part of Spring Hill. The structure supplied and purified water for West Philadelphia. According to the water department's annual report for 1859, the idea for the waterworks was first conceived in 1851 by citizens of West Philadelphia and on January 24, 1853 the plant began operation.⁴³

The neoclassical circular and domed engine house was flanked on either side by a one-story boiler room. A 120' brick steam stack was erected at the west end. A stand pipe, located two thousand feet to the south (off zoo grounds), was used to secure water pressure instead of a reservoir which was never built on the site. The waterworks were not long lived. In 1871, they ceased operation after being replaced by the Belmont Waterworks erected about a mile to the north. However, the buildings were not immediately demolished. They were incorporated into Schwarzmann's plan for the zoo and continued to appear on maps until 1898, though the exact year they were removed is unknown. There is no record of the building being adapted for reuse. However, according to the first guidebook to the zoo and an article in Sunday Transcript in 1873, there were plans to make an aquarium from "the deep basin which was once the forebay" of the waterworks.⁴⁴

When the land was acquired by the Zoological Society in 1873, it possessed many remnants of past use from the grand to the vernacular. While all architectural vestiges except the Penn Mansion and the Twenty-Fourth Ward Waterworks were demolished soon after the society's occupation, some of the landscape features, such as the northern creek and many trees, and possibly roadways, were incorporated into the zoo landscape.

According to zoo horticulturists, an English Elm, now located by the greenhouse in a non-public area, and, perhaps a beech tree to the north, are the last living fragments of Penn's gardens. Though no longer visible, his flower garden was located just north of Bird Lake, at the site of the aviaries and his

⁴³ Frederic Graff, Jr., History of the Works, and Annual Report of the Chief Engineer of the Water Department of the City of Philadelphia (Philadelphia: C.E. Chichester, Printer, 1860), pp. 39-41.

⁴⁴ Quotation from Edwin E. Hulfish, Illustrated Guide and Handbook of the Zoological Garden of Philadelphia (Philadelphia: Allen, Lane & Scott Publishers and Printers, 1875).

"wilderness" area at the Pachyderm House. The evolution of the land from private to public pleasure ground was concomitant with an international movement towards the democratization of parks. The first plan for the zoo garden was an elaboration of Solitude's picturesque design scheme adapted for public use and for the changing conceptions of natural beauty and recreation.

Schwarzmann Plan, 1872-1876

Within the first few months of reorganization in 1872, the zoological society contacted the London Zoo for advice on planning and operating a zoological garden. At thirty-three acres, the oblong-shaped Philadelphia Zoo grounds were almost exactly the same dimensions as the London Zoo which was a wedge-shaped lot measuring thirty-four acres.

Hermann Joseph Schwarzmann, Fairmount Park's chief engineer and architect, was selected to design the zoo grounds. Although after having layed out the revised plan for Fairmount Park and the plans for the Centennial Exhibition Schwarzmann was an experienced landscape architect, there is no evidence that he had any expertise in designing an environment to keep wild animals. An unsigned plan for the site dated 1872 attached to the zoo's first annual report is believed to be Schwarzmann's design (see Figure #4) The zoo must have anticipated a lease for the property from the Fairmount Park Commission because the plan is dated a year before the lease in 1873.

Although Schwarzmann left no written explanation of his plan, the landscape he composed is a prime example of the picturesque park designs ubiquitous in the late nineteenth century. Like many European zoos, it also mimicked private menageries on country estates. The grounds contained cages, paddocks, and ornamental buildings set amid trees and shrubbery with pathways for people to stroll amongst the scenery. Variegated architectural and landscape elements were combined to create an overall unified form.

Following general park designs advocated by the prominent landscape designers John Loudon and A.J. Downing in the 1840s, Schwarzmann's zoo plan had a limited number of entrances in order to control the flow of movement through the park. Gates were situated at both the north and south ends of the main west walk. A pedestrian tunnel on the east side, like those at London Zoo and Central Park, linked the zoo to the river (where a steamboat landing was erected) and its bordering park land.

Leading from the north entrance were two relatively straight walkways that afforded broad vistas of the gardens. The stately character of the entry way was accentuated by the placement of a large animal house and formal geometric plantings. Narrower and

more curvilinear pathways extended off the main walks and divided the garden into separate sections. The windy nature of the paths and the sharp angle of their intersections promoted a sense of suspense and surprise as strollers blindly approached an animal display or significant landscape feature. They also created a sense of isolation in a park filled with people.

A comparison of Schwarzmann's plan with images of the area before the zoo's occupation provides some insight into the ways in which existing landscape features were utilized. After all, integral to nineteenth century park design was the accentuation rather than the eradication of natural landscape forms. Schwarzmann utilized the old growth trees from the Penn gardens to create dense groupings of vegetation at pathway intersections. Hedges and trees were added as necessary to conceal segments of the landscape from particular vantage points. They also functioned as shade and as screens for walkways.

While the creek at the south end was filled with dirt, the one at the north end was transformed into a picturesque feature which also served as a watering trough for deer. A winding path with rustic bridges crossed it at various intervals. Once emptying into the river, on Schwarzmann's plan, the creek terminates into a small pond at the east end of the park. The natural spring that feeds the creek is used by Schwarzmann to create two lakes at the south central part of the grounds. While the smaller lake never materialized, the larger lake, complete with island, was excavated in 1874 and became an important focal point of the zoo landscape.⁴⁵ As Jacob Weidenmann noted in Beautifying Country Homes, "A landscape without water is imperfect, no matter how beautiful otherwise it may be."⁴⁶

While the Yarnall farmland was carved with walkways, the smaller farms to the north were unified as an open lawn. Like the London Zoo, Schwarzmann surrounded the park with a dense border of trees in order to hide the streets and railroads located all around its periphery. It is difficult to judge from his plan how he intended to change the slope and grade of the land. However, an article in a local newspaper stating that "about fifty men are daily employed in digging and carting..." suggests quite a bit

⁴⁵ The lake covers slightly more than two acres.

⁴⁶ Weidenmann, Jacob, Victorian Landscape Gardening: A Facsimile of Jacob Weidenmann's Beautifying Country Homes (Watkins Glen, NY: The American Life Foundation, 1978) p. 29. Originally published by Orange Judd & Co., New York, 1870.

of grading was undertaken.⁴⁷

Even though wild animals were the main focus of the zoological garden, it was not constructed to mimic a wilderness setting, or otherwise echo their natural habitats. Despite the appearance of the first guidebook cover, propagating a challenging and fearful environment, the landscape was really intended to serve as a relaxing rational retreat. (see Figure #5) Thus, an environment was created with the viewing public, rather than the animals, in mind. Instead of allowing the animals to roam free, they were penned or caged within structures so that they could be admired close-up while posing little threat. While Schwarzmann's plan outlines the footprints for these animals houses, the key to the plan identifying their functions was lost and individual drawings for each of them do not exist. Perhaps Schwarzmann just intended the footprints to be a general schemes of the buildings because it was not until after the plan was completed that he was sent to Europe to study zoo architecture.

Funds for the zoo's construction and operations were obtained from the sale of certificates of stock for at least one hundred dollars each, the sale of "subscribing memberships" for five dollars annual, and the sale of admission tickets for twenty-five cents apiece. Revenue also was drawn from the lease of the restaurant and other refreshment and novelty stands.

While Schwarzmann was abroad, ground was broken for the zoo. Within the first year of occupancy:

drains, and water pipes to connect with city mains, [were] laid; the ground graded; walks vulcanized; deer parks constructed; an entrance lodge, monkey house and enclosure for buffalos built; a temporary barn.. for the winter keep of animals' presented;..."Solitude" restored and repaired; the stream through the Garden widened, dammed, and rustic bridges thrown across; cages made; and the enclosed space suitably arranged for the purposes of the Society.⁴⁸

Despite this flourish of activity, only a third of the grounds, including Solitude, were accessible on opening day July 1, 1874. However, physical improvements to the grounds continued at an unrelenting pace after the zoo opened so that the full thirty-three acres were ready for the thousands of tourists flocking to

⁴⁷ Sunday Transcript, 1873 as quoted in Paul Jones, "Birth of the Zoo in 1873," Evening Bulletin, July 20, 1953.

⁴⁸ The Second Annual Report, 1874, pp. 13-14.

Philadelphia for the Centennial Exposition.

Visitors reached the zoo on foot, or via carriage, local passenger train, or steamboat. A rail siding was placed at the northwest corner of the park and a boat landing was located just south of the Girard Avenue bridge near the north entrance. Only a photograph survives of what was either the first north gate house built prior to the ones designed by Furness and Hewitt in 1876, or a side gate house located along the east side of the zoo, approximately thirty yards from the north entrance.⁴⁹ (see Figure #6) According to J. Vaughan Merrick, a founding member and Chairman of the Building Committee, a gate house was moved from the north to the south entrance after the new larger houses when constructed.⁵⁰

The gate houses are a matching pair of ornamental buildings that were separated by an elaborate wrought-iron gate and sign proclaiming entry into the "Garden Zoological Society." (see Figure #7) They were constructed of grey stone and red brick with tall dormers and fancy wood trim. The way-out gates were added to the north end the same year of construction. The sculpture, Dying Lioness by Wilhelm Wolf, was transferred from the Centennial Exposition grounds a year later. The bustle of activity at the north entrance (see Figure #8) far overshadowed that at the lesser used south entrance for which no images survive. The pedestrian tunnel included on Schwarzmann's 1872 plan was never created.

During the first year of operation, the zoo's animal collection already contained 674 birds, 131 quadrupeds, and eight reptiles. There were "Grizzly or Cinnamon Bears, Elks, Black-Tailed Deer, a colony of Prairie Dogs, Ravens, Eagles, Wolves, and so on."⁵¹ Some animals were received through donation. For example, in 1874, "Mr. Theodore L. Harrison...presented his fine collection of live birds, amounting to over 100, with cages..."⁵² Stories

⁴⁹ The authors of Frank Furness: The Complete Works claim that Furness designed a "narrow roof" side gate which certainly matches the appearance of the image, however, I found no other documentation affirming this assertion. George E. Thomas, Michael J. Lewis and Jeffrey A. Cohen, Frank Furness: The Complete Works (New York: Princeton Architectural Press, 1991).

⁵⁰ Letter from J. Vaughan Merrick to Arthur Brown, September 5, 1903, Philadelphia Zoo Archives.

⁵¹ John Ridgway, Jr., Secretary, "Report," March 1, 1874. Philadelphia Zoo Archives.

⁵² The Second Annual Report, 1874, p. 18.

survive claiming that Brigham Young donated two bear cubs, Ulysses Grant donated two curassows, and Mrs. Sherman donated a cow kept by her husband during his storming of the South during the Civil War.⁵³

Other animals were bought by the zoo from travelers and merchants. President Camac hired Mr. Frank Thompson to be superintendent in 1874 for which the duties included oversight of the purchase and transport of animals from around the world and the supervision of their maintenance and care on zoo grounds. He was instructed to make a "daily record of animals received; state of weather each day; temperature, barometer and rain gauge three times each day; record of sick animals and cause; and amount of food received and consumed."⁵⁴

Besides animal keepers, a variety of positions relating to the entertainment and comfort of visitors were filled. A local confectioner was given a one year lease to the restaurant and ice cream and cake stand in 1874. A "Band of 16 pieces of music [was requested to perform] every week day afternoon from 2 to 7..." perhaps in the gazebo.⁵⁵ Photographers were hired to operate a photo stand. Donkeys or goats harnessed to carts, and, beginning in 1879, elephants saddled with howdahs offered rides to willing passengers.

Early plans of the garden reveal that the Schwarzmans scheme was generally carried out, however, disparities did exist. The placement of the paths was approximately followed. They were made of "vulcanized pavement" which consisted of "a base of broken stone four inches thick well rolled, then two coats of fine clear gravel and sand properly vulcanized."⁵⁶ The north

⁵³ John Toovey, "Philadelphia: Philadelphia Zoological Gardens," in Lord Zuckerman, Great Zoos of the World: Their Origins and Significance (London: Weidenfeld & Nicolson, 1979) and Reuther, "Philadelphia Zoological Garden," among others.

⁵⁴ "Plan Proposed for the Organization of the Officers and Employees of the Zoological Society of Philadelphia," November 20, 1873. Philadelphia Zoo Archives.

⁵⁵ Contract with Carl Sentz, May 1, 1876. Philadelphia Zoo Archives.

⁵⁶ Agreement between the Vulcanite Paving Company and the Zoological Society of Philadelphia, November 4, 1873. Zoo Archives. According to Webster's dictionary, vulcanization is "to treat (crude rubber) with sulfur under heat to increase its strength and elasticity." The material is an early form of asphalt, though light in color.

creek was incorporated into the landscape but the deer paddocks bordering it were placed on its south side instead of the north side as Schwarzmänn intended. The walking path along the creek was placed to the south of its course instead of meandering back and forth across it. Three bridges were built across the creek but from other larger pathways.

Several early photographs and engravings capture the quaint setting created by the stream, beaver pond, old growth trees, shrubbery, rustic bridges and fencing, and scenic vistas.⁵⁷ (see Figures #9-12) These images reveal how integral open spaces were to the early landscape by providing visual links between distant features and by creating tranquil natural settings by themselves. Other postcards and photographs portray the great variety of textures and shades emanating from the trees and shrubs that were planted along pathways. A row of beech trees juxtaposed to open lawns, perhaps planted by Penn, was also recorded on plans and illustrated in the first guide book to the zoo published in 1875. Swan pond, now called Bird Lake, was encircled by widely-dispersed willow trees that both provided shade and allowed for unobstructed views across the water.⁵⁸ Both the lake and stream were habitats for waterfowl.

According to the third annual report in 1875, "A Propagating House for Plants, [was] erected, thirty-one Deciduous Trees, thirty-one large Evergreen Trees, twenty-five Dwarf Deciduous Trees, eighteen shrubs, ninety vines, twenty-four flowering plants and four hundred and eleven flowering bulbs [were] planted; a large surface of ground sodded, flower beds laid out and hanging baskets and plants prepared for animal houses."⁵⁹ An average of three hundred dollars of the annual budget was spent on horticulture during the first ten years of operation. By 1883, over six hundred deciduous trees, eight hundred evergreen trees, six hundred shrubs, one hundred vines, and thousands of flowers had been planted.⁶⁰

⁵⁷ The location of these photographs on today's landscape is the path between Bird Valley and the flamingo habitat.

⁵⁸ According to William B. Calwalader, author of Bears, Owls, Tigers and Others! : Philadelphia Zoo, 1874-1949 (New York: The Newcomen Society, 1949), Tchaikovsky dedicated "Swan Lake" to Bird Lake in 1876.

⁵⁹ Third Annual Report, 1875.

⁶⁰ Data from the annual reports from 1875 to 1885. Clues to the placement of the vegetation are provided by "A Plan for the Improvement of the Zoological Garden of Philadelphia," signed by C.H. Miller which identifies the types of plants used at specific

"The head gardener of the society must be a man of taste and ability. This is evident every where through out the grounds," exalted Maria Howland in an article about the zoo in the April, 1879 issue of Harper's Magazine. She continued:

The pink crepe myrtle, so shy of blossoming in our amateur gardens and conservatories, grows there like a weed, and flowers as luxuriantly; while the ribbon beds of many-tinted foliage plants and brilliant flowers are dazzling in their beauty, and nowhere show puny or sickly response to the gardener's skill....And, finally, the wealth of grand old growth trees, many of them gigantic in size, and the rolling surface of the land, render the whole place naturally picturesque and beautiful."⁶¹

Accenting the plantings, of course, were animal houses, fountains, and other ornamental structures. Even though Schwarzmunn was sent to Europe to study zoo architecture in 1873, there is no record that he ever designed any of them. Instead, some of the Philadelphia's best known architects contributed designs and supervised their construction. The new buildings were eclectic, ranging from the rustic stick-style architecture inspired by John Ruskin, to Moorish designs, and Gothic Revival structures. More than deriving inspiration from the needs of the animals, the buildings were primarily motivated by a desire to create a mood compatible with an urban park setting.

One of the ways animals did inspire the architectural designs was through the cultural stereotypes that they engendered. For example, the carnivore house (designed by Collins and Autenrieth in 1874), the home of "the king of the beasts," was the most palace-like of all of the buildings. It was located at the highest point in the garden and its facade was graced by a terrace, similar to that at the London Zoo. A set of steps led up to flower gardens planted in the courtyard formed by the building's towering wings. In contrast, some of the paddocks for hoofed animals from Africa contained thatched-roof huts similar

locations. The plan is undated but because the antelope house is shown under construction, it was probably made in 1875 or 1876. Although many fanciful details, such as a cascade and a southern series of lakes, are incorporated into Miller's map, because the placement of some plants correspond with those indicated on the 1875 plan, it can be used guardedly as a reference tool. The circumstances under which Miller submitted his plan are unknown.

⁶¹ Maria Howland, "The Philadelphia Zoo," Harpers Magazine, volume 58, April, 1879, pp. 699-712.

to ones used by many tribal populations there or fanciful rustic shelters. (see Figures #13 & 14) Equally exotic was the building designed as an aviary by Theophilus Chandler in 1874 and converted into the reptile house in 1888. The Moorish-inspired stained-glass windows and frames and elaborate dormered roof reflected the foreign origins of its occupants.

The elephant house, antelope house, restaurant, and pavilion (designed by Furness, Hewitt, or both, 1874-1876) were all Gothic Revival in style and incorporated some of their "favorite picturesque compositional devices" such as complex masonry and wooden trim.⁶² They were located in a row along the west walk and were separated from the carnivore house by a long stretch of paddocks. The restaurant had a long front piazza with Moorish-style gazebos on both ends. (see Figure #15) The elephant house's sharply pitched dormers and arched doorways were similar to the architectural features of the elephant house at the London Zoo designed by Anthony Salvin in 1869. (see Figure #16) The antelope house was designed in a cruciform plan with a vaulted wood ceiling but, on the exterior, detailed wood-trimmed dormers made it look more like a country cottage or barn.

Located near the center of the garden and just west of Solitude was the shingle-style oval-shaped monkey house designed by Theophilus Chandler in 1874. It was constructed of "buff brick with terra-cotta facings, upon a cut-stone base."⁶³ It was similar to the London monkey house which also was designed like a garden conservatory with windows lining the walls. Down the hill to the south of the monkey house were the large stone bear pits also designed by Chandler in 1874. As a comparison of images reveal, the pits were patterned after a medieval design that was used in nearly every zoo established through the nineteenth century. (see Figures #17 & 18) Chandler's stone structure was divided into three compartments, each of which contained a central climbing pole. Iron gates secured each bear pit, adding to the fortress-like quality of the edifice. Because they were banked into the hillside, visitors could either look down on the animals from atop the west wall or view them at ground level through the gates. By 1878, a polar bear pit was added near the south entrance. Besides the bear pits, other outdoor animal enclosures included a radial-design deer paddock similar to those at Versailles and common in private menageries, aviaries, seal pools, a prairie dog village, and small rustic cages and pens scattered throughout the grounds. (see Figure #19)

⁶² Ibid., p. 41.

⁶³ The Twenty-seventh Annual Report, 1899.

Although a great amount of imagination was displayed in the buildings' exteriors, their interiors were quite plain. Little effort seems to have gone into their design. Usually the animals were lined up in iron-railed cages set in rows along the walls which provided spectators with a center corridor in which to browse. Or, in the case of the monkey house, a single cage was placed in the middle of the building so people could walk around it.

Initially, there were no outdoor facilities connected to the indoor pens so the animals were kept inside around the clock. Within the aviary building, birds were usually kept in small cages that provided easy observation but little or no room for mobility. Some of the larger outdoor aviaries, such as the eagle aviary designed by Chandler in 1874, were slightly more functional, nevertheless, they exemplified architectural prowess more than serviceability.

Even though the architecture reflected an ignorance of animals' needs, from the zoo's inception, the employees showed concern for their charges' welfare. Before the second summer of operation, the zoo added to its rules and regulations a five dollar fine for anyone "molesting, disturbing [the animals], or giving [them] tobacco or unknown noxious articles."⁶⁴ Furthermore, the inadequacies of the animal houses were noted almost immediately by zoo officials. As the superintendent stated in the annual report of 1879, "When we consider the unnatural conditions to which an animal is subjected under confinement and which the exigencies of a manager often unavoidably demand, the wonder is not that the animals die but that they live."⁶⁵ J. Vaughan Merrick, one of the zoo's founders, wrote in 1903, "In all these buildings we were groping in the dark and had to make our own experience [which], of course, involv[ed] many errors...."⁶⁶ Despite this repudiation, in some instances, it took years for modifications to be made. In the case of the bear pits, it took more than a hundred years for the facilities to be replaced.

Renovations, 1877-1927

The most noteworthy changes to the Zoo during this period are the adaption of seemingly more hospitable animal enclosures and the

⁶⁴ Document dated May 13, 1875 located in the Zoo file, Fairmount Park Commission Archives.

⁶⁵ Henry Chapman, "Report of the Prosector," The Seventh Annual Report, 1879.

⁶⁶ J. Vaughan Merrick, letter to Arthur Brown, September 5, 1903. Philadelphia Zoo Archives.

creation of a research laboratory devoted to the investigation of diseases and morbidity of confined animals. These developments were motivated by the poor health, breeding, and survival rates of the captive animals. As zoos worldwide became more active in the preservation of species threatened with extinction, these factors took on a heightened urgency. Certainly the keepers were also attuned to complaints about poor ventilation and unpleasant odors from health-conscious Victorian patrons. As early as 1876, Henry Chapman, the zoo's prosector, enumerated "the principal causes of death...[including], first, Improper food, both in quantity and quality; second, effects of Temperature, third, Ill constructed cages, wanting in sufficient space and deficient as necessary appurtenances, such as water to bathe in, tree to climb, soil to burrow in, etc., according to the nature of the animal."⁶⁷

Despite the acknowledged severity of the situation, the general design scheme of the buildings remained the same. Even the new ones built in this period, such as the bird house, aviary, and monkey house, maintained traditionally ornate exteriors and plain unadorned interiors. However, there were piecemeal alterations of the existing quarters, such as the additions of skylights, windows, and adjoining outdoor pens, that provided improved conditions for the animals and the visitors.

The zoo depended on the sale of admission tickets and memberships to help pay for improvements. Yet, after the rush of visitors during the Centennial Exposition, admissions, and concomitantly income, dropped considerably. The decline was attributed to economic depression, to a loss in the zoo's novelty, and to competition from the growing number of amusement parks and resorts. In 1891, the Fairmount Park Commission began contributing an annual grant of money to the zoo in exchange for tickets for the city's school children to assist with the improvements.

The monkey house was the first building to be replaced. In 1896, Theophilus Chandler designed a Romanesque-style structure to succeed the one he designed in 1874. The older conservatory-like building was almost immediately deemed inadequate because of extremely poor ventilation. Nevertheless, it was converted into a small mammal house. By contemporary standards, the interiors of the two buildings were not vastly different. The new building, located at the northwest corner of Bird Lake, had better ventilation, larger indoor cages, and new outdoor cages but the facility still provided very little space, privacy, or semblance to their natural habitats.

⁶⁷ Henry Chapman, Appendix B: Report of the Prosector, Fourth Annual Report, p. 35.

Three new aviaries also were constructed around the turn of the century. In 1882, Furness and Hewitt designed a parrot house located at the southern end of the west walk. "By reason of improved ventilation, free admission of light, and immunity from rats and mice, its accommodations are much superior to those of the old Aviary," explained Arthur Brown, in the Zoo guidebook of 1886.⁶⁸ Nine years later, it was enlarged to include eighty-two cages and glazed with white tile. The impetus for these changes are revealed in the 1901 annual report. "On the side of the public, it is believed that both interest and instruction are better served by placing each species in a separate cage, then by mixing together in larger enclosures, a number of different kinds which it is practically impossible for uninstructed visitor to identify." This statement demonstrates that despite a growing awareness of the problems in zoo exhibitions, the needs and comfort of the visitors were still paramount over those of the animals.

In 1907, an ostrich house of "irregular and pleasing design" (now the primate discovery center) was erected on the west walk, opposite the restaurant.⁶⁹ However, the most prominent avian addition to the garden was the Beaux-Arts bird house designed by Mellors and Meigs in 1916. It was located on the eastern side of Bird Lake which created not only picturesque views across the lake but artistic reflections in the lake as well. The slender columns and open pediment of its neoclassical facade reflect the influence of the City Beautiful Movement and an attempt by the architects "to reflect the 'lightness and featheriness of the birds'."⁷⁰

The bird house contained a large flying cage in its center pavilion and rows of cages along each wall. (see Figure #20) There were also outdoor cages. No attempts were made to mimic the birds' natural habitats because, according to the architects, they might interfere with the spectacle of the animals. They explained, "Birds are in themselves a decoration and need only a pleasant background against which to group

⁶⁸ Arthur Erwin Brown, Guild to the Garden of the Zoological Society of Philadelphia, Fourth edition, (Philadelphia, 1886), p. 48. American Philosophical Society.

⁶⁹ According to Karen Stein in "Animals House," (reprint of article in Architectural Record, February, 1987), the building was designed by George Hewitt. This author was able to document her assertion.

⁷⁰ Architects quoted in Sandra Lee Tatman, "A Study of the Work of Mellor, Meigs, and Howe," (M.A. Thesis, University of Oregon, Department of Art History, 1977), p. 30.

themselves in order to form a succession of pictures of such amazing variety and color as no mural painting can equal."⁷¹

Two wings were added to Chandler's (1874) aviary in 1888 when it was transformed into a reptile house. Unlike the aviaries (and most other buildings for that matter), rather than leaving the cages bare, they were furnished with "natural surroundings of plants and shrubs - such conditions being those most necessary to the life of the animal, and at the same time giving to the interior more the appearance of a conservatory than a reptile house."⁷² Other improvements to animal quarters include the addition of a bathing pool for elephants in 1881; the replacement of sewer pipes in order to provide better drainage of pens in 1892; the fencing of a honey-locust tree to create a natural shelter for raccoons in 1903; the installation of swinging doors in monkey cages to provide free access to the out-of-doors, and a general increase in the number of outdoor cages and runs, such as those for wolves and foxes at the south end of the Zoo, that afforded "an abundance of fresh air and sunshine which was not obtainable in old, dark, and ill-smelling pens."⁷³ (see Figure #21)

Zoo staff also began to experiment with exposing animals to periods of cool, fresh air. They previously had believed that tropical species, such as monkeys, were ill-prepared for a temperate climate and so kept them confined to heated buildings. Gradually, the outdoor periods were extended when no ill-effects were noted. To their surprise, the animals showed all signs of thriving, even in the depths of winter.

Although the zoo staff had been recording morbidity data since its inception, in 1901, Dr. Charles Penrose established a laboratory to facilitate medical care and research. Initially, the William Pepper Research Facilities at the University of Pennsylvania was used and then a make-shift lab was set up in the zoo's palm house. Finally, in 1905, a separate building to house a "pathological laboratory, infirmary," and operating room was constructed on zoo property. A second floor was added in 1912. According to Philadelphia Zoo literature, it was the first of its kind in the world.

Of primary concern at the lab was tuberculosis which had ravaged birds, reptiles, herbivorous mammals, and especially primates. The year the lab opened, the staff began segregating and

⁷¹ Ibid.

⁷² The Fifteenth Annual Report, 1887.

⁷³ The Fifty-second Annual Report, 1924.

evaluating every primate that entered the garden for the disease. In 1911, the Philadelphia Zoo was the first to employ the tuberculin test on primates. In the belief that they were combating the spread of germs and disease, rustic wooden fences and pens were replaced with more durable and hygienic iron ones. Other modernizations to the garden included the incorporation of a full telephone system in 1912 and the gradual replacement of vulcanized walks with concrete ones beginning in 1913.

Another important change in the zoo grounds during this period was the addition of eleven acres of land along the east side of the park in 1913. The new territory was utilized as a deer park that contained rows of chain-link fenced pens. The deer paddocks located on the south end of the creek were dismantled and the animals were moved to more spacious paddocks along the new eastern border. A buffer of one hundred and twenty-five pine trees were planted along the perimeter in 1918. As visitorship fell, the horticulture budget was tightened, though shade trees and ornamental shrubs continued to be added throughout the garden. The 1925 annual report noted, "As usual, about one hundred trees and shrubs were planted and labelled."

The "Free and Modern Zoo," 1928-1955

From its inception, the Philadelphia Zoo had undertaken little work towards the incorporation of more humane animal quarters. What work was undertaken in this regard was done on a building by building basis. However, between the 1930s and 1950s a master plan to reform the entire zoo landscape was implemented. The "modern zoo," as it was called, stressed the use of hygienic indoor facilities and the use of outdoor grottos that simulated the animals' natural habitats.⁷⁴ In so doing, the zoo utilized more highly trained personnel and modern infrastructure on the zoo grounds. The zoo publicly announced in 1936 that "After extensive study, consultations with leading scientists and zoologists, and detailed research here and abroad, meeting the Director's specifications and embodying all that science and architecture can contribute to the ideal zoo, new plans have been completed."⁷⁵

⁷⁴ Even though the animals were placed in earthly grottos, in this early period, they were still displayed as taxidermic species without reference to the interrelationships between animals from similar geographic regions.

⁷⁵ The Jungle Comes to Philadelphia (Philadelphia: Philadelphia Zoological Society, 1936).

The premise for the new designs was based on the work of Carl Hagenbeck, a German animal trader and trainer. Hagenbeck conceived of the idea of confining animals in simulated natural environments in order to encourage their natural behavior and to create a more pleasing and unobstructed arena for the viewing public. In place of iron rail cages, Hagenbeck created large open-air enclosures embellished with artificial rock formations, animals' native vegetation, and moats to safely separate the animals from visitors and antagonistic species from each other. Hagenbeck presented his ideas at his Tierpark Zoo, founded in 1906 in the town of Stellingen, near Hamberg, Germany and in his book, Man and Beasts, published in 1909.

Many zoos around the world began to abandon the "dark and narrow confines of the prison" cell-like cages for the naturalistic open-air animal exhibits.⁷⁶ By the 1920s, zoos in London, Paris, St. Louis, and San Diego, among many others, had adopted naturalistic habitats in at least a portion of their parks. In 1928, the architects Paul Cret, well-known for his public buildings and city-planning projects, and Edwin Clark, the designer of the Brookfield Zoo near Chicago and a consultant for the National Zoo in Washington, D.C., were commissioned to make a study of the Philadelphia Zoo garden and prepare a plan for future development in line with Hagenbeck's designs. A building committee composed of members of the Board of Directors selected the architects and the zoo staff provided them with recommendations. The guiding principal was to "retain as much as possible of the present gardens, [while] providing Philadelphia with an institution in keeping with ideal [zoo] standards."⁷⁷

The architects' plans, dated 1930, illustrate strong influences from both Hagenbeck and the City Beautiful movement. Links to the former are apparent in the lion and bear grotto at the south end of the park. In the plan dated May 9, 1930, a cascade of water from Bird Lake feeds ponds placed in each grottos. In another plan ("Scheme A"), it feeds into a smaller lake located at what is now Picnic Grove.⁷⁸ None of these water features ever materialized but the grottos, called "Wolf Woods," were constructed in the 1970s. In contrast to the naturalistic landscape of the animal pens are the broad straight walkways leading into the park. In imitation of the boulevards of the

⁷⁶ Letter from William Cadawalder, President of the Zoological Society of Philadelphia to Philadelphia Mayor S. Davis Wilson, July 8, 1936. Philadelphia Zoo Archives.

⁷⁷ The Jungle Comes to Philadelphia.

⁷⁸ This scheme of a series of ponds is somewhat reminiscent of Miller's landscape plan of 1875.

White City, the pathways in Scheme A terminate at circular intersections decorated with fountains or sculptures. However, in the May 9, 1930 plan, which was adopted by the zoo, winding pathways of a picturesque type are retained for all but the north entrance.

Some prospective buildings also are indicated on these early plans, designed by Cret. They include an animal house and pool--the future site of pachyderm house and grottos (1941)--located on the site of the restaurant, a service building (1938) next to the laboratory, a refreshment stand (1938), and a set of bird houses or cages placed on either side of the existing bird house (which were never realized). Modifications also included the introduction of larger cages, more open-air enclosures, mesh fencing to replace iron railing, and new plantings and grading. In 1930, the old gate house was demolished and a new one placed just to its north. The French Provincial gate house designed by Cret has a greystone base, limestone walls, and a slate roof. Intricate wrought-iron entrance and exit gates that incorporate animal figures into the design harmonize with the rustic and Victorian work already on the zoo grounds.⁷⁹ A parking lot was added to the corner of the lot and interior walkways and plantings were altered as indicated on Cret's plan.

The metamorphosis of the zoo obviously required a tremendous financial outlay. Almost all zoos, especially in the United States, were supported in total by their municipal governments. The Philadelphia Zoo, on the other hand, was a private corporation with only a third of its budget derived from city coffers. It was the only major zoo in the country that needed to charge admission in order to cover the cost of operations and maintenance. It continued to receive earnings through the sale of memberships and the rent of refreshment stands, too. In the 1930s, the zoo also attracted significant private and public donations to assist with its redevelopment.⁸⁰

Unfortunately, this was not enough to keep out the national financial crisis. At the same time that the zoo was attempting to implement its new modernization plan, admissions dropped,

⁷⁹ They stand in quite a contrast to the art deco stainless steel and neon entry gates that Cret also designed but were never constructed for the zoo.

⁸⁰ For example, the Pennsylvania Railroad financed the reconstruction of the south entrance in exchange for a tiny portion of the zoo property needed for the railroad's own renovations.

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memberships fell, and city subsidies were decreased by one third during the Depression. In order to prevent its full demise, the zoo began an all-out campaign in 1933 to encourage visitorship and fiscal assistance for the modernization of the grounds. Convinced that the lackluster attendance record was related to its admission fee and poor facilities, zoo management sent a formal request for two million dollars to the City Council "for rebuilding the zoo on modern cageless lines and establishing it as an institution without admission charges to the general public five days a week."⁸¹ The Citizens Committee for A Free and Modern Zoo was formed to elicit public support through a massive media crusade. A model for Cret's plan was displayed on the zoo grounds and radio stations and newspapers throughout the city promoted the cause. Among the many handbills distributed was a pamphlet, The Jungle Comes to Philadelphia, that outlined the zoo's initiatives and a broadside calling for a public mass meeting. Unfortunately, it would be many years before this money would be forthcoming.

Unlike the 1870s, when the zoo was promoted as a scientific institution for rational recreation, the modern zoo was to be a place with a "gala atmosphere...transform[ing] the gardens from an outdoor museum into a vital, pleasant recreation area in which patrons may cast aside their cares."⁸² Another article, entitled, "Zoo to Offer Circus Thrills Under Education Plan," reiterated this point by noting that the zoo was "casting aside its former drab role as a zoological garden [and] emerging as a vital community enterprise...."⁸³ The zoo was publicized as a retreat from the stress of economic uncertainty. "A place," extolled the annual report of 1933, "where those burdened with troubles and grievances, either real, or imagined, can find some measure of relief from the hard reality of the city streets and so lose themselves amid interesting and beautiful surroundings rather than to give way under the stress of their troubles and find an outlet through sordid means and even unlawful acts."⁸⁴

In order to fulfill its goal as a center of amusement and diversion, the zoo added programs and attractions that encouraged visitor participation and entertainment. Animal shows of "a proper kind" were introduced, such as circus-like elephant acts,

⁸¹ Pamphlet, "Citizens for a Free and Modern Zoo," 1936, Philadelphia Zoo Archives.

⁸² "The Zoo Fixes Things Up - Music as You Meander," Evening Bulletin, June 5, 1939.

⁸³ Evening Bulletin, May 5, 1935.

⁸⁴ Annual Report, 1933, p. 19.

even though the by-laws clearly prohibited such enterprises. The ban on feeding of animals also was lifted. From 1934 to 1936, the bird house had a free-access canary cage where patrons entered to feed the birds. In 1935, a rabbit village, designed as a miniature Cape Cod town was placed at the south end of the lake. A year later, a "model dairy barn" was erected through the support of the Philadelphia Interstate Dairy Council. This red gambrel-roofed barn housed cows, pigs and sheep, and offered demonstrations in milking cows.

A "Baby Pet Zoo," modelled after Europe prototypes, opened on May 1, 1938 at the old site of a deer paddock southwest of Solitude. Like the dairy barn, it allowed children to come in contact with young domesticated and wild species. Children could borrow kittens, rabbits, and other small animals from the Pet Bank while playing in the Baby Pet Zoo. Five times a day, baby chimpanzee's gave stage performances such as bike riding and roller skating. Pony rides and elephant rides were offered on either side of the site. Although education was implicitly a goal of these new activities, the level of anthropomorphizing of the animals and the showmanship diminished its significance.

Other forms of leisure activities previously absent, or long absent, from the zoo grounds were introduced. A public address system was installed in order to announce upcoming events and to provide a serenade of music to visitors in the garden. One hundred benches were set up on the lawn near the bird house for live musical concerts. The food vending was updated. The main restaurant was torn down in 1938 and replaced by a refreshment stand designed by Cret. The stand was initially leased to John Holland Company but by the end of the year the zoo had taken over all concessions in hopes of generating more income. At the same time, Picnic Grove was created south of Bird Lake. The original facility was like a public recreation park with a covered pavilion and souvenir stand, tables and benches, and a playground with swings and a slide.

Unable to obtain city funds at this time, the remodeling was paid for by private donation and by the zoo's standard income base. The zoo also sought and received support from the federal government. Assistance from the Federal Emergency Relief Administration for Public Work and the Civilian Work Administration allowed the zoo to renovate the animal quarters and the general infrastructure. During the mid-Thirties, four hundred federally-subsidized workers repaired old walks and added new ones, dug moats for the buffalo pens, and planted fifteen hundred crabapple, Japanese cherry, arbor-vitae, larch, other varieties of trees donated by A.E. Wohert of Narberth, Pennsylvania. They were planted around the lake, restaurant,

west walk and north entrance.⁸⁵

Vegetation took on a heightened importance in the Hagenbeck-inspired zoo landscape. No longer simply decorative motifs for the park setting, they had a much more utilitarian role in enhancing the animals' environments. For example, the scenic willow trees planted around bird lake in the 1870s were replaced by shrubbery that attracted migratory birds. Although a log or a branch might have been used in the past as a perch in a cage, now plants "act[ed] as food, nesting materials, camouflage, secreting places and even a home."⁸⁶

One of the first exhibits that fully incorporated plants and other natural materials into its design was the reptile rock garden, reptilarium, constructed in 1930. This outdoor moated enclosure contained piles of rocks, plants and shrubs, a pond, and a waterfall in which snakes, lizards, and turtles could slither and crawl. Like Monkey Island, a combination of natural stone and fabricated jungle gym built near the south gate by W.P.A. workers nine years later, the bar-free enclosure permitted the animals "plenty of opportunity to exercise and furnish[ed] laughs for their human audiences."⁸⁷

Research at the laboratory (renamed Penrose Laboratory in 1935 after Charles Penrose, the president of the Zoo from 1909 to 1925) also influenced animal health and display. Great progress was made towards the control of TB and other airborne infections. In 1931, primate displays were revolutionized by the installation of plate glass on their indoor cages, an act that essentially eradicated TB at the zoo. Prior to this discovery, about three-quarters of the monkey population died each year and an individual's average life span was only six months.⁸⁸

Important advances were made in nutrition. Many animals at the zoo died from malnutrition in the past because of staff ignorance regarding their dietary requirements. Dr. Herman Ratcliffe of

⁸⁵ See Handy Pocket Guide to Help You Enjoy the Philadelphia Zoo, ca. 1930, for list of types of flowers, shrubs, and trees planted. Philadelphia Zoo Archives.

⁸⁶ David Hancock, Animals and Architecture (London: Hugh Evelyn Press, 1971), p. 144.

⁸⁷ "May Day at the Zoo," Fauna, March 1939, p. 14. Monkey Island was one of many similar facilities built by the W.P.A. in zoos in Detroit, San Francisco, Cincinnati, and other cities.

⁸⁸ Herbert L. Ratcliffe, "The Penrose Laboratory," America's First Zoo, volume , 1955, p. 20.

Penrose Lab, invented the "zoocake" in the 1930s, the first prepared food for captive animals. It is a mixture of "ground yellow corn, whole wheat, barley, rolled oats, cottonseed meal, soybean meal, brewer's yeast, skim milk, with smaller amounts of alfalfa leaf meal, oyster shell flour, cod liver oil, and vitamins and minerals."⁸⁹ Another unique finding at the lab was that flamingos retained their distinctive pink color when their diet was supplemented with carotene. Before this discovery in 1955, the birds commonly lost their hue after being captured from the wild.

In order to facilitate the transition from laboratory innovation to implementation on the zoo grounds and in order to streamline many other behind-the-scenes functions, Cret designed a service building next to the laboratory in 1938. In place of a motley collection of barns and sheds, the service building centralized and modernized food preparation and maintenance operations in one structure. It contained a modern cold storage facility, slaughter house, grain bins, and carpentry shop. Despite its progressive interior, the exterior resembled a rural Pennsylvania farm building. The stone structure has an one story and two story section, each with a single pitched-roof and shuttered windows. The lower section is topped with a spire and a weather vane.

The service building was financed by a generous endowment from Mr. Wilson Catherwood after his death in 1925. With these funds the Zoo also began its program of replacing "ugly, unsanitary, and unsafe" animal houses with ones that held "odors at a minimum and showed animals in agreeable surroundings."⁹⁰ Maintenance was a chronic obstacle with the old buildings. Their wooden floors and walls held odors and pests, and quickly rotted from constant cleansing. Problems were exacerbated by the fact that it was difficult or impossible to remove the animals during the clean-up.

The new buildings addressed these issues by installing service corridors to transport animals from one enclosure to another or to an outdoor pen, and by installing tile floors and walls that were easily and quickly cleaned by high pressure water hoses. Other considerations addressed were the need to construct buildings out of fire-resistant materials such as brick or stone and the need to maintain old animal quarters until the new ones were constructed since temporary lodging was both impractical and

⁸⁹ Alyssa N. Scheuermann, "'FIRSTS' at the Zoological Society of Philadelphia," September 25, 1984. Philadelphia Zoo Archives.

⁹⁰ "Rebuilding the Zoo," America's First Zoo, 1946, p. 91.

unsafe.⁹¹

The first major building to be replaced was the pachyderm house. It was designed by Cret and was erected on the site of the restaurant in 1941. Instead of containing rows of barred cages like the 1874 building, it had barless interior enclosures (except for the elephant stall which was still caged) with access to outside yards with pools. Like the service building, it was designed to look like a Pennsylvania German barn, complete with hex sign. The building also resembles Cret's French Provincial south gate house.

Landscape elements fulfilled both practical requirements and esoteric preferences. The animal yards were planted with trees and bordered with rocks to provide shade and natural scenery. The rocks also discouraged escape. Moats were the most prominent means of enclosure and, unlike cages, they also permitted unobstructed panoramic views of the animals. A narrow patch of grass was planted between the moat and a low rail fence to add greenery and to create an additional barrier between the animals and public. Even though the new facility seems like an obvious improvement over the old one, one of the elephants was obstinate about changing quarters and had to be dragged fitfully to the new compound. The pachyderm house was the only building completed before the construction ban during World War II. The zoo joined the war effort by planting a 26,000 foot Victory Garden at the site of the old elephant house in 1943. Potatoes, tomatoes, carrots, onions, spinach, lettuce, corn, and other vegetables were grown to feed the animals.⁹² The plot was fertilized with the zoo's own composite heap.

With the American economy in an upward spiral after the war's end, the city of Philadelphia finally was able to address the zoo's financial request. As a part of a City Council ordinance passed in 1947 for urban improvements, the zoo received one million dollars, half of their original petition. While the city permitted the zoo to act as supervising agent with contractors, it did not give them authority to sign contracts. Even after the zoo's charter was revised in 1947, it was still under the auspices of the Fairmount Park Commission.

City funds were used to modernize the interiors of the reptile house in 1948 and the bird house in 1950, and to construct a new carnivore house in 1951. Renovations of the older buildings

⁹¹ Letter from Freeman Shelly and Roger Conant to Sidney Tyler and R. Sturgis Ingersoll, September 13, 1937 written in response to a request for their recommendations for the new zoo.

⁹² "Zoo Victory Garden," Fauna, March 1943, p. 31.

consisted of the installation of plate glass in front of each enclosure and the incorporation of running water, plants, rocks, and artificial landscape elements within them. The new bird house exhibits, designed by Hatfield, Martin & White, included the landscaping of nineteen separate habitat groups, improvements in the flying cage, and the removal of all outdoor cages.⁹³ Despite these innovations, the simulated nature, i.e., painted backdrops, often benefitted the viewer more than the animal.

The carnivora house was promoted as a showpiece of modern zoo architecture. The building was designed by Harbeson, Hough, Livingston and Larson, who were associates of Cret. The building was situated on the site of the old pachyderm house along the west walk. Cret's plans to revise the old carnivore house, once the cornerstone of the Victorian zoo, were never realized. It sat empty until 1965 when it was demolished and replaced by a rare mammal house. The new building was constructed of fieldstone and was designed with a central tower and two eighty-three foot long wings that form a courtyard in front. Bordering the courtyard are thirty small iron cages that connect to indoor pens. At the end of each wing is an outdoor naturalistic grotto planted with vegetation to simulate an East African landscape. Twenty-four foot wide and fifteen foot high moats separate the big cats from the public. The only naturalistic element inside the building was a decorative tropical garden planted around a fountain in the center pavilion. Otherwise, the interior was a paragon of sterility. Cage walls and floors were lined with tile to ease maintenance. Despite the hygienic atmosphere and the proud announcements of the building's modernity, the facilities' iron cages are starkly similar to the ones that they replaced.

Just as the quaint architecture gave way to more sleek and standardized structures, so, too, the zoo's landscape become more regularized and less rustic. Although shade trees continued to be replaced, many of the exhibition areas were trimmed with lawn instead of shrubs, creating a more open and sanitized appearance similar to the ball field settings of suburban recreational parks. Some of the most striking changes in the landscape were the renovations of the stream and beaver pond. Since the natural spring was no long functioning, a new water line was laid under the stream to connect with a city line. The rustic wooden bridges across the stream were replaced with more permanent stone structures and the rustic wooden fences were replaced with more sturdy wire mesh ones. (see Figure #22) In 1936, the beaver pond was re-dredged and its borders and island were lined with rocks and reshaped into more uniform circles. These alternations not only changed the durability of the site but the aesthetics as

⁹³ Outdoor cages were deemed unsightly and dangerous to the birds.

well. Quaintness and eccentricity gave way to refinement and practicality.

Between 1948 and 1954, the stream bed was lined with concrete and divided by stone walls into a series of seven separate enclosures with pools. (see Figure #23) The pens became the home to penguins, storks, swans, and other aquatic birds in separate enclosures without access to each other. A fenceless display for flamingos with a nesting island and wading pool was added along the old course of the stream. Shrubbery previously planted along the stream was replaced with a very low close-cropped hedge. In 1957, the "depressing and unattractive" beaver pond was done away with altogether. A shallow cement-lined ornamental pool for exotic ducks was installed in its place and landscaped with rhododendron, laurel, and bamboo.

According to treasurer's reports, an average of \$12,000 was spent on horticulture between the years 1937 and 1949. The sum nearly tripled in 1950, reflecting in part the increased use of plants within exhibition areas and the replacement of greenery lost during construction. Other developments in the gardening department was the enlisting of the services of two horticulture specialists, Ms. Idella Krause and Ms. Rena Middleton, by 1950 and the donation of a greenhouse a year later. The formal rose garden that the two designed for the area between the north entry gates and old lion house in 1950 was indicative of the "modern" zoo landscape. Ironically, as the animal enclosures became more naturalistic, the overall zoo landscape became more domesticated and less romantic.

1956-1979

By the mid-1950s, the hope of establishing an admission-free zoo was abandoned. However, many other zoos across the country were also under financial duress and were beginning to charge entry fees. Income at the Philadelphia Zoo was needed not only for the maintenance of the growing animal population but also for the continued redevelopment of the grounds.

In 1956, the firm of Harbeson, Hough, Livingston and Larson were hired to design an architectural program for the next decade. As Cret's proteges, the firm not only inherited Cret's offices but his design philosophy as well. In keeping with the modern approach to zoological display, their buildings were constructed with exhibit facilities that promoted the best view of the animals in a simulated natural environment. The interior halls had a museum-like quality which emphasized the visitors' reception of the pens over their practicality for the animals. Furthermore, the compartmentalization of the displays accentuated animals separateness and alienation from each other and from humans.

The initial development plan, estimated to cost \$5,500,000, consisted of the conversion of the old carnivore house to an ape house with additional outdoor cages, the remodeling of the reptile house and small mammal house, a new rare mammal house, a new kangaroo house, a new giraffe and antelope house, a new penguin house, an open-air African Plains exhibit, and new bear and wolf grottos. It also provided for a new administration building, additional parking lots or garages, the remodeling of souvenir and refreshment stands, and the "simplification of the maze of paths facing the visitors at the north entrance to the garden."⁹⁴ Funds for the alterations were supported in part by the City's Capital Improvement Program. With certain modifications, all the goals were reached within the next twenty-five years. They are all still a part of the zoo landscape, though some not without consternation.

Harbeson, Hough, Livingston and Larson designed most of the buildings. Besides the carnivore house built in 1952, they contributed designs for the rare mammal house, the reptile house, the camel house, the lab annex, and the administrative building. Unlike the Victorian appeal for eclectic architecture in zoo gardens, the preference in the 1960s was to erect structures with similar materials and designs to harmonize the landscape. Each structure was made of native fieldstone and accommodated "ultra-modern" facilities. Their relatively austere exteriors reflect the functionalism of the International style also popular with civic buildings of this period.

Of the new animal houses, only the camel house had outdoor facilities. They were deemed "an unnecessary luxury" and an actual threat to the animals because of air pollution and uncontrolled feeding by visitors.⁹⁵ The camel house is situated on the site of the old wood-fenced "ramshackled" camel shed and pen.⁹⁶ The shelter was enclosed in a paddock surrounded by a dry moat. An archetype for a "controlled indoor environment was the rare mammal house built across the lawn to the northwest of the camel yard. The arc-shaped structure was built on the site of the old carnivore house in 1965. The enclosures were tiled-lined and glass-faced to provide ease of maintenance. Because of their starkness, they were soon renovated to include vine swings, fiber glass trees, and simulated rocks.

⁹⁴ William F. Feist, "\$5,500,000 Development Planned at Zoo," Philadelphia Inquirer, February 13, 1957.

⁹⁵ Frederick A. Ulmer, Jr., "Philadelphia Zoo's Rare Mammal House," International Zoo Yearbook, 6: 119-120 (Zoological Society of London, 1966).

⁹⁶ America's First Zoo, 1962.

The animals placed in this building were chosen because of their scarcity, illustrating that exoticism at the zoo was no longer judged by foreignness but also by rarity. "By providing ultra-modern quarters that assure cleanliness and comparative isolation," stated the June, 1965 issue of America's First Zoo, "the Zoo hopes to breed and thus help to preserve many of the species that, because of pressure from the exploding human population and man's encroachment upon wild life habitats, may soon disappear."⁹⁷ Three bas-relief sculptures of primates threatened with extinction decorated the exterior exemplifying the building's theme.

The glass-walled facade of the rare mammal house encircles the impala fountain terrace that was erected a year before it. The graceful leaps of the steel impalas are accentuated by powerful jets of water spraying up from the fountain beneath them. The area adjoining the fountain and building was laid with concrete and landscaped with a few shrubs and trees. Except for the hundred year old sprawling ginkgo tree that was saved during construction, the area looks more like a civic center than a home for wildlife. And, because the fountain and terrace jut out so far from the building, unlike the old terrace that abutted the carnivore house, they block the vista of the grounds below.

The new small mammal house (designed by Hatfield, Martin and White and erected in 1967) replaced one that was built in 1874.⁹⁸ In keeping with the current motif of the park, the building was constructed with Pennsylvania fieldstone that was accented with limestone and brick. A large rotunda with a pointed roof topped with a weather vane at the south end also harkened back to the barn-like quality of Cret's edifices. The interior contains glass enclosures elaborately decorated with artificial rock and earth formations. One wing accommodates a nocturnal hall with lighting that reverses daytime and nighttime conditions. The area is illuminated with infrared light during the day so that visitors can view the animals, such as flying squirrels, under night conditions when they are naturally most active.

The reptile house also replaced an 1874 building. The building that was razed was originally an aviary that had been converted to a reptile house in 1888. It contained large glass-enclosed pens furnished with tropical plants, waterfalls and pools, and mural-painted walls. The building was constructed with special heating and cooling systems for cold-blooded animals. One of the

⁹⁷ America's First Zoo, Vol. 17, No. 2, June, 1965.

⁹⁸ According to the December, 1965 issue of America's First Zoo, a shell of a portion of the old building was incorporated into the new one.

enclosures was constructed with a system to produce electronic thunderstorms in imitation of actual tropical weather.

Unlike the reptile house, patrons can actually walk into and through the displays at the hummingbird exhibit erected in 1970. The idea for the facility originated with a similar walk-through display at the London Zoo, obviously still a model for other zoological gardens. The unadorned classically-inspired structure was designed by Kneeder, Mirick & Zantzinger to compliment the Beaux-Arts bird house to which it was attached. In contrast to the exterior's simplicity, the interior contains pathways, bridges, and observation platforms immersed in a myriad of streams, tropical plants (some of which are artificial) and avian wild life. The exhibit is roofed with plate glass to help "create a feeling of walking through a semi-tropical rain forest."⁹⁹ Staff of Longwood Gardens assisted the Zoo staff with the selection of tropical plants. The facility was renamed jungle bird walk when other species of birds were introduced to the habitat.

The success of such exhibits was facilitated by research conducted at Penrose Lab. The continued importance of the lab is illustrated by the erection of a new wing in 1965 which doubled the amount of work space. The addition was paid for by a matching grant from the U.S. Public Health Service, exemplifying the importance of its accomplishments beyond the confines of the zoological garden.

The bureaucracy of the Zoo also outgrew its quarters. In 1972, a new administration building built on the eastern boundary of the zoo ushered in a new era of zoo management and education.¹⁰⁰ Besides providing office space and conference rooms to the extra tiers of personnel, the new building became headquarters for educational and public programs. It contained an auditorium for lectures, theatrical performances, and films, and offices and classrooms for the volunteer docent program.

With the establishment of an education department, entertainment at the zoo returned to a focus on zoological instruction rather than superfluous recreational activities. However, the erection of a monorail system around the periphery of the park, reflects a challenge to keep up with competition offered at neighboring

⁹⁹ America's First Zoo, 1970.

¹⁰⁰ Solitude was restored as an historic site and opened to the public in 1976.

theme parks.¹⁰¹ One of the monorail stations was placed next to the children's zoo, one entertainment center that was expanded instead of eliminated. The children's zoo was placed on a two acre enclosed lot near Picnic Grove at the south end of the park. Designed by Hatfield, Martin and White, it was constructed in 1957 to replace the Baby Pet Zoo which had closed thirteen years earlier. The children's zoo offered a fairy tale-like landscape for the viewing and handling of animals. (see Figure #24) There was a stable and a corral where youngsters took "rides across the Plains" and a "Chuck Wagon" restaurant where they ate.

Attractions also included a miniature Noah's Ark that housed small mammals "docked" in a duck pond and a Pennsylvania German red-painted barn that housed domesticated animals. Both were designed for a child's level of understanding, and were sized accordingly. The facility also contained animal sculpture, a jungle gym, and a Foto-Fun Booth where photographs were taken with the animals. To distinguish it from the rest of the garden, the area was enclosed by a tall fence and elaborate entry gate. There were no pathways in the area. A few trees were planted within its confines.

Another landscape feature added to the Zoo was a rose garden planted between the carnivore and pachyderm houses in 1960. The north entrance also was revamped. A fieldstone-faced refreshment stand, souvenir stand, and restroom were added just inside the entrance. The walkways were widened and a mosaic of a pair of pythons was incorporated into the cement. A narrow strip of lawn was also introduced in the middle of the path. It led up to a large granite elephant and calf by Heinz Warneke, and the future site of the rare mammal house just beyond it. A row of trees were planted on either side of the walkway.

Vines and shrubs were introduced around the garden to soften the harsh stone walls the animal buildings and the enclosures along Bird Valley. In the early Seventies, three islands made from the rubble of new exhibition areas were added to Bird Lake. They were planted with willows, bayberry, water lilies, and other plants to encourage nesting.

The early Seventies marked an important transition at the Zoo, one that required the close scrutiny of the newly formed garden maintenance department. Instead of creating indoor displays as in the Sixties, the Zoo focused on developing large outdoor naturalistic exhibit areas. There was a growing concern for animal welfare in confined indoor exhibits from the professional staff and from the general public. The public denouncements were

¹⁰¹ The monorail was destroyed by fire in 1980 but was immediately rebuilt.

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elicited partially from a greater knowledge of animals in the wild gained from televised nature shows.

In 1972, the zoo submitted a seven million dollar proposal to the Bicentennial Corporation for the completion of the 1950s master plans. Included in the proposal were plans for new bear dens, an African Plains exhibit, renovations to the monkey and rare mammal houses, and improved visitor facilities and parking lots. Although the Zoo was in difficult financial straits, by the end of the decade it had constructed four open-air exhibits, including Wolf Woods, Bear Country, and two areas called African Plains. Each barless moated enclosure contained trees and shrubs for shade and privacy that replicated or mimicked the animals' native vegetation (or a local Pennsylvania variation of it); animal houses camouflaged by artificial rock work; and, when possible, mixed displays of animals. They were designed to "de-emphasize the presence of people and emphasize the presence of animals."¹⁰²

Wolf Woods, designed by Hatfield, Martin and White was built at the south end of the park in 1973. The quarter acre terraced grassy lot replaced a row of fenced and concrete-floored pens for foxes and wolves. During the next two years, African Plains I and African Plains II were built across the walkway from each other on the site of deer paddocks and a lawn, respectively. African Plains I is a series of four moated enclosures designed to replicate the landscape features and vegetation of the animals' home region. (see Figure #25) Artificial rocks conceal the dens of the zebras, giraffes, warthogs, and other native African animals. A forty foot tall fiberglass baobab tree serves as foil for patrons and, inside a hidden door, a shelter for birds. Ironically, several old growth trees that shaded the old deer paddock were cut down for the new "naturalistic" pen. African Plains II is a two-and-a-half acre grassy lot that serves as a home to smaller hoofed animals and birds. Locust trees, look-alike substitutes for African acacias, were planted around the lot.

Bear Country is a circular 217.8 foot diameter exhibit area designed by Mirick, Pearson, Ilvonen and Batcheler. It replaced the Victorian bear pits which, astonishingly, were still in use until the new habitat was constructed in 1978. The project was funded by the city and Zoo's Animal Conservation Fund. The exhibit is divided into four sections each of which houses a different bear species, such as sloth or polar bears. They are furnished with rocks, trees, logs, and mock naturalistic dens. Moats, glass or plastic walls, and electric barriers are used to

¹⁰² Paula Herbut, "Art Board Praises Plan for African Plains at Zoo," Philadelphia Inquirer

separate the bears from each other and from the public. Multiple vantage points for viewing the bears, including clear acrylic panels installed below the surface of the polar bears' pool, are also provided. Underground dens were added so the bears can escape the glares of visitors.

The vegetation in some of these habitats is difficult to maintain. According to the Zoo's horticulturist, Charles Rogers, Jr., "The zebra ate all the grass in the African plains within a month after they went out there. The wolves acted like wolves. They chew the pine trees, wreck the birches."¹⁰³ This problem was resolved by erecting barriers around the plants, as in the African Plains I exhibit, or by planting species that the animals find unappealing. For example, in order to prevent the denuding of the waterfowl habitats, rhododendron and laurel were planted which birds do not like to eat. Prickly bushes were planted around the elephant bins to discourage the animals from pulling them up.¹⁰⁴ Because grass in African Plains I was eaten so quickly, suggestions were actually made to replace it with astroturf! Fortunately, the advice was never heeded.¹⁰⁵

While the new habitats improved the conditions for animals and visitors alike, their erection was not without some sacrifice. The deliberateness with which the old buildings were replaced during the zoo's redevelopment suggests not only a desire to improve the quality of the park but also an indifference to the structures' cultural and historical significance. The less romantic and more scientific approach to zoo exhibitions also influenced the zoo landscape. Utilitarian needs, whether pragmatic or recreational, superseded the importance of maintaining those spaces as integral elements of the park setting.

Master Plans of 1980s

Even though over a million visitors toured the Zoo annually in the Seventies, it was on the brink of closure. Fortunately, it was rescued by another large grant from the City Council. In order to return the Zoo to fiscal soundness and to implement a plan for its future development, the Board of Directors hired

¹⁰³ Patricia Spollen, "Flora at Zoo as Exotic as Its Fauna," Philadelphia Inquirer, August 16, 1974.

¹⁰⁴ Undated article in the Philadelphia Inquirer located in the Newsphoto Collection, Urban Archive, Temple University, Philadelphia, PA.

¹⁰⁵ "Zoo Plans Natural Enclosure," Philadelphia Inquirer, June 29, 1969.

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William Donaldson, an experienced municipal manager, as president in 1979. Pivotal to the program that Donaldson adopted with the assistance of Zoo staff and other planners and advisors, was the recovery of the Zoo's fiscal health, the expansion of public education programs, the enhancement of animal exhibits and research, and the improvement of maintenance of the zoo grounds.

In order to control the progress and implementation of these goals, the Zoo's by-laws were rewritten so that it finally "possess[ed] all...powers and means appropriate to effect the purposes of the Society" that were previously under the domain of the Fairmount Park Commission. Donaldson also created new avenues for raising funds, such as the Corporate Sponsors Program which traded admission tickets for donations, and the leasing of Zoo grounds during evening hours for private parties. The Zoo was promoted through publicity drives to expand membership. And, since the zoo still primarily depended on sales of admission tickets and concessions, plans for special exhibits, public programs, and new animals were introduced to draw people to the grounds.

New education programs designed to demonstrate the relationships between humans, animal, and plants in an entertaining and relaxing manner. More lectures by animal keepers, additional labels for animals and plants, and new audio-visual devices were provided to enhance the public's appreciation of wildlife. The upgrade of old exhibits and the creation of new state-of-the-art facilities were also intended to improve educational opportunities, to provide a better understanding of animals in their natural settings, and to expedite scientific research.

A new emphasis was placed on Philadelphia's cultural history as expressed in the historic structures still remaining in the park. For the first time in its history, the zoo was viewed as a treasure not just because of the animals but because of the history illuminated in its landscape. Rather than eradicating evidence of the past, efforts were made to retain and to re-introduce Victorian architecture and the nineteenth-century picturesque ambience.

The firm of Bohlin Powell Larkin and Cywinski were hired to design a master plan that carried this theme throughout the park. Art Nouveau light posts, signage and follies, such as wrought-iron bird cages, were placed around the garden. A gazebo (also reminiscent of a Victorian bird cage) was placed near the north entrance. It enclosed a fountain and a set of benches to create a garden resting area. The yard around Solitude was re-landscaped to include boxwood, herbs, and other historic plants. Like the other retro-additions to the garden, the plant arrangements were not necessarily historically accurate, nevertheless, they expressed an impressionistic image of a

historical period.

Although the side buildings were not replaced, the main north entrance houses were renovated by Agoos Lovera in the 1990s. The original wrought-iron gates were returned to the site and the landscape architects Menke and Menke reintroduced nineteenth century-style plantings outside the gates. And, in keeping with this Victorian theme, the new ZooShop replicated the design and the location of the horse sheds built south of the gate houses in 1876. Picnic Grove was another restoration project that incorporated nineteenth-century style motifs. A fountain was added to the center of the plaza and wrought iron benches and tables replaced the wooden picnic furniture.¹⁰⁶ More trees and exotic plants were added to enhance the feeling of a "green oasis" as the zoo originally was intended to possess. The site was redesigned by Alan Holm and John Caulk in 1987.

Penn Woodland Trail helped reintroduce a park setting while presenting an historical landscape on Zoo grounds. Located on the site of Monkey Island in 1983, the two acre lot is a recreation of four seventeenth-century Pennsylvania habitats including deciduous woods, a marsh, a meadow, and an evergreen forest. Caged animals are placed within the appropriate habitats, such as a bobcat in the hardwood forest and a snowy owl in the meadow. The trail also commemorates the indigenous Lenni Lenape Indians by noting the ways in which they historically utilized the natural world in their daily and religious lives. A twelve-page guide to the trail offers information about the ancient habitats and the animals and humans relationship to it.

While much of the new construction during the 1980s was retrograde, some contemporary designs were introduced. For example, a new eatery, the Impala Fountain Cafe, by the design team of Ueland and Junker is a modern glass-walled edifice constructed adjacent to the rare mammal house. Children's facilities were also updated to reflect contemporary attitudes towards animals.¹⁰⁷ Educational programs that illustrate animal and human interdependencies and that promote greater care and respect for animals were implemented. The old anthropomorphic displays, such as Noah's Ark, were dismantled and animal performances were discontinued. The farm animal demonstrations

¹⁰⁶ It was also furnished with modern metal tables and chairs.

¹⁰⁷ The master plan called for the relocation of the children's zoo to the site south of the antelope house where another activity center was planned. However, this project did not receive funding and so, as an alteration, the old children's zoo was remodelled.

were maintained but the dairy barn was converted into an ice cream parlor. Islands of trees and shrubs were added to re-introduce a more picturesque setting.

Despite various schemes through the years to tear down the antelope house by Furness and Hewitt, it survived. After standing vacant since the mid-Seventies when the animals were transferred to the African Plains exhibit, the building was refurbished to make room for a children's activity center in 1985. The "TreeHouse," as the facility is called, was designed by Mary-Scott Cebul, zoo director of planning and evaluation, and the architectural firm of Venturi, Rauch and Scott Brown. It was deigned "to communicate to children what it's like to be, rather than see, various animals and live in their world."¹⁰⁸ Rather than stressing factual data, the exhibit strives to inspire greater empathy towards the animals. A giant synthetic ficus tree, honeycomb, insects, plants, prehistoric swamp, and bird's eggs were built for children to climb on and around so that they might experience the world from animals' perspectives. Sounds and smells of the animals' world also are incorporated into the displays. More pragmatically, as an indoor exhibit, the TreeHouse is an enticement for rainy day zoo visits.

Concurrent with the educational goals cited in the new by-laws was the pledge "to enhance the preservation and propagation [of animals] with particular emphasis on endangered species." This oath was manifested in the continued research on diseases, nutrition, aging, and reproductive biology at Penrose Lab, participation in captive breeding programs, and the creation of animal enclosures that encouraged propagation by replicating as close as possible natural environments. Non-public facilities including a waterfowl brooding house built in 1982 and a new animal hospital that is under construction in 1996, also advance these goals.

"The African Plains, the Hummingbird Exhibit and Bear Country...are examples of good zoo planning," stated President William Donaldson.¹⁰⁹ On the other hand, he viewed the rare mammal house less generously as an example of the "public washroom school of architecture." Animals kept in cramped cages "sit around and mope, they pace, they pull at their hair," he elaborated.¹¹⁰ The most antiquated of all the animal quarters

¹⁰⁸ America's Finest (Philadelphia Zoological Garden, ca. 1983), p. 6.

¹⁰⁹ Quoted in Henry R. Darling, "'Open windows of the wilds'," Evening Bulletin, 1979.

¹¹⁰ Ibid.

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were the stark iron cages of the second monkey house which was built in 1896 and modified only slightly over the succeeding years. Cited as unfit for renovation to meet current zoo exhibition standards, the monkey house was demolished to make way for the World of Primate exhibit in 1986. The carnivore house of 1951, with its sterile interiors and outdated outdoor grottos, was condemned. There are plans to turn the carnivore house into an education center after Lion's Lookout, a natural habitat for big cats, is constructed.

All of the new exhibits incorporate the design philosophies of the landscape architectural team of Long and Long and their protege, Jon Charles Coe. Of foremost importance to their exhibits are the needs of the animals. Naturalistic habitats constructed of artificial rock formations contain native vegetation that mimics the animals natural surroundings. Where possible, old growth trees were saved and incorporated into the setting. No jungle gyms or other props that might interfere with the simulated natural setting are permitted in these exhibit spaces. Unlike Hagenbeck designs--now viewed as romanticized images of a wilderness landscape--these exhibit spaces were made more realistic in order to meet the social and physical needs of the animals. Such habitats encourage natural behavior (i.e., breeding), therefore supporting the research and conservation missions of the zoo. Some exhibits are so authentic that zoologists have used them to study the activities of animals in the wild.

Another important facet of the designs is to help shape visitors perceptions of, and interacts with, the animals. In order to "create an atmosphere in which animals dominate and people are subordinated," the animals are displayed at eye level, similar to how they are seen in the wild. Furthermore, plant material and rock formations are extended out into the visitors space so that they appear to be in each others midst. Pathways are constructed and shrubs and trees planted to control how the animals are viewed. The paths are designed to incite a feeling of discovery and isolation by twisting and turning through the exhibits. The vegetation creates private pockets so animals, not people, command the landscape.

The "World of Primates" designed by Venturi, Rauch and Scott Brown was the first such immersion-style exhibit at the Zoo. It opened in 1986. The 1.1 acre facility contains a moated outdoor enclosure subdivided into four islands, an indoor "holding" area, and a multi-media orientation center with indoor naturalistic habitats. Following Coe's design concepts, the habitats and the pathways lining them are heavily planted with trees and shrubs to create continuity and to promote the illusion that the visitors are within the animals' world. "All plantings are, of necessity, temperate zone, hardy look-alikes to their tropical counterparts

except the red hot poker, an African native," explained an exhibit guidebook.¹¹¹ The long, low rectangular indoor facility is adjacent to the orientation center (previously the kangaroo house) along the west walk. Its sleek modern facade with checkerboard brick work and curved retaining wall contrast sharply with the earlier zoo structures. Two large picture windows provide views of the lush primate habitats designed by the landscape architects Hanna-Olin on the other side of the building. The facility supports gorillas, drills, gibbons, orangutans, and woolly monkeys, among other primates. Tragically, the building caught fire in December, 1995 and twenty-three primates died. Plans are currently underway for its reconstruction.

Carnivore Kingdom, described as "one and a half acres of theatrical art and illusion," opened in 1994.¹¹² The exhibit takes visitors on a narrow windy walkway through high rock formations that enclose six separate grottos. The site was designed by Bohlin Cywinski Jackson in close consultation with the zoo planners Coe Lee Robinson Roesch, Inc. The animal houses are camouflaged behind rock work; vegetation masks barriers in order to simulate a wild landscape. At the south end of the exhibit, a wrap-around otter pool grotto allows the viewer to see the animals below and above the surface of the water. A stream appears to empty out into a marshy unenclosed landscape, creating the illusion that the otters' territory extends into the visitors' own.

This small pocket of marshland is one of the ways that rugged nature has returned to the zoo grounds. In the nineteenth century, the land was embellished with plants, follies, and water features to create a public pleasure ground. Only a small portion of the total acreage was devoted to animals. During the current building campaigns, the trend is reversed. Animal grottos will occupy more of the land leaving fewer public park areas. These landscape transformations reflect changing values and priorities. The zoo is no longer just an isolated haven of natural abundance for urban dwellers but for wild creatures as well.

¹¹¹ Rose Ann Smarr, "World of Primates: Report of Horticulture," (Philadelphia Zoological Society, July, 1988).

¹¹² Quotation from a Philadelphia zoo typescript labelled, "Carnivore Kingdom," February, 1992. Lion's Lookout, a similar habitat planned for a site across the walk, is not yet under construction.

DESCRIPTIVE INFORMATION

The contemporary zoo landscape is a tangible record of the zoological society's history. Since innovative zoological design ideas and architectural styles never swept the grounds in masse, the zoo always remained a mixture of divergent forms and trends. In this section some of the pertinent historical features and historic reproductions that are included in, and excluded from, the modern landscape are described.

The only surviving features of the pre-zoo landscape are the stream bed, where Bird Valley now lies; the Solitude mansion; the English elm tree on the west side of Solitude, and the beech tree on the north side of it, both of which might have planted during Penn's occupancy. No remnants of the Yarnall estate or its predecessors remain. However, ironically, the site of the mansion, which was initially going to be converted into a restaurant, is now Picnic Grove, one of the zoo's dining areas. The southern creek has been buried since the 1870s but continual drainage problems along its course make its presence known in the 1990s.

Vestiges of the Victorian era include buildings, pathways, natural landscape features, sculptures, and Schwarzmann's plan which was never fundamentally altered. The north gate houses, which date from 1876 (though not all building appendages remain) are icons of the zoo's historic legacy. Through the years, the north entrance has been remodelled and variously paved, sodded with grass or landscaped with formal flower beds and topiary, or more naturalistic shrubs. The area was last renovated in 1994 by the landscape architects Menke and Menke and the architectural firm of Agoos Lovera. According to zoo staff, they referenced archival photographs and prints before laying out their designs. The original entry gates were repaired and returned to their place between the houses. The wayout gates are original and date to 1876. The sculpture, Dying Lioness has been situated at its present site since 1877, when it was transferred from the Centennial Exposition.

The only surviving nineteenth animal quarters is the antelope house built in 1876. Turn-of-the-century structures include the orientation pavilion of the World of Primates which was built as a flightless bird house in 1907 and the Beaux Art bird house constructed in 1916. Of the three, only the later still is used as an animal shelter though it has undergone extensive interior renovations. The last nineteenth-century structures to be razed were the bear pits which were dismantled in 1978 and the parrot house designed by Furness and Hewitt in 1882 which was destroyed

when Picnic Grove was renovated in 1987.¹¹³ The prairie dog village has been of fixture at the zoo since its inception. It was relocated from its original site on the greenhouse lawn to the north side of Picnic Grove in 1938 and, finally, to its present site in front of the antelope house in 1986.

The concrete-lined duck pond at the end of Bird Valley was once a beaver pond. It was created in 1874 by damming the natural stream. The pond was streamlined twice during the zoo's existence, once in the 1936 and again in 1957 when the concrete basin was added. Bird Lake and its large central island were created in the 1870s. The three smaller islands on the north side of the lake were added a hundred years later. As the lake's vitality as a waterfowl nesting preserve has grown, its former role as a central visual focal point of the park has abated. With tremendous overgrowth of the bordering vegetation, the picturesque vistas that it once provided are now obscured from view. This phenomenon is repeated over much of the Zoo's landscape. Over the years, the broad vistas and open spaces that were crowded out by new animal houses and habitats. In some cases, vegetation, which perhaps simply outgrew its original design scheme, also caused the loss of some of these views and visual relationships.

The greenhouse lawn and the impala lawn are the only two remaining grassy areas at the zoo. The first lawn contained small scattered cages in the early years but was never built or heavily planted upon. The second lawn was used as a paddock for buffalo and later for other hoofed animals but it too was never more than an open plain. Efforts were made to maintain old growth trees where possible but their survival is traditionally of second importance to building campaigns. A ginkgo tree at the Impala Fountain terrace, and a magnolia tree near the south entrance to the rare mammal house survive from the 1870s when they were planted beside the original carnivore house. Two yellowwoods growing near Solitude also date from this period.

The garden contains several decorative features that imitate Victorian decor. They were constructed in the 1980s to bring aesthetic harmony to the park. Only the ZooShop, which is modeled after the horse sheds dating to 1876, is based on an historic prototype at the park. Retro-Victorian embellishments include the lightposts, signage, the entry gazebo and fountain, several wrought-iron bird cages, and the Victorian Picnic Grove decor. Despite the Groves' title, it was conceived in the 1930s not the 1870s. The lamp posts that line the path to the Grove document

¹¹³ Judging by a contemporary slide, the parrot house seems to have been altered beyond recognition of its original appearance by the time it was torn down.

the 1980s plan to make this walkway a central axis in the park, thereby replacing the original west walk which was to be incorporated into the children's zoo.

By comparing nineteenth century plans with the most current one, it is evident that the original pathways are generally followed though their courses are slightly diverted or broken up. Some of these changes are also visible in the park. For example, the path that used to lead straight into Solitude from the south now clearly terminates in shrubbery and the path leading to monkey island gradually terminates into Penn's Woodland. A straight row of London planes running north-south at the southwest border of bird lake give a clear indication of where an older path once led.

Significant early twentieth century edifices include the 1916 bird house by Mellor and Meigs, and the 1930 south gate house and wrought-iron gates, the 1941 pachyderm house, and the 1938 service building, all designed by Paul Cret. The only vestiges of his master plan are the curving walkways near the south gate and the straight broad path leading from the north gate to the rare mammal house. This last feature was not actually brought to fruition until Cret's protege's Harbeson, Hough, Livingston and Larson reworked his plans in the 1950s. All formal rose gardens from this later period were eradicated. The reptile rock garden (constructed 1930) survives as a significance landmark because it is the first naturalistic habitat constructed at the zoo. If future development plans at the Zoo continue to recognize the significance of historic architectural and landscape features, these artifacts will survive into the future.

Architects¹¹⁴

Blackney and Hayes:

Zoo commissions: pachyderm house porch, 1994.

Bohlin, Powell, Larkin and Cywinski (later Bohlin, Cywinski and Jackson):

Zoo commissions: 1980s master plan; Bird House interior renovations, 1987; Carnivore Kingdom, 1991; Lion's Lookout, future.

Caulk and Holm:

Zoo commissions: Victorian Picnic Grove, 1986?

Theophilus Chandler (1845-1928):

¹¹⁴ For many of the entries, I relied on Sandra C. Tatman and Roger W. Moss, Biographical Dictionary of Philadelphia Architects, 1700-1930 (Boston: G.K. Hall & Co., 1985).

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Zoo commissions: bear pits, 1874; restaurant, 1876; eagle aviary, 1874; monkey house, 1874; aviary, 1874; monkey house, 1896.

Chandler was born in Boston and attended Harvard University for one year before transferring to the Atelier Vaudremer in Paris. He came to Philadelphia in 1872. He was founder of the University of Pennsylvania, Department of Architecture. He is best known for his Gothic ecclesiastical designs.

Coe Lee Robinson Roesch, Inc.:

Zoo Commissions: Carnivore Kingdom, 1991; Lion's Lookout, future; World of Primates renovations, future.

Landscape architects specializing in zoological park planning and design.

Ewing Cole:

Zoo commissions: ZooShop, 1982.

The zooshop design is a copy of the horse shed designed by John Crump that stood where the ZooShop is now located from 187 to .

Collins & Autenrieth:

Zoo commissions: carnivora house, 1874; temporary restaurant, 1874; skating house, 1874.

Edward Collins (1821-1908) and Charles M. Autenrieth (1828-1906) were in partnership from 1853 to 1902. They worked on a wide range of commercial projects.

Paul Cret (1876-1945):

Zoo commissions: Modern zoo plan, 1920s-1930s; south gate house, 1930; pachyderm house, 1941; service building, 1938.

Cret was born in Lyons, France and attended the Ecole des Beaux Art in Paris. He was a professor of design at the University of Pennsylvania, Department of Architecture for thirty-four years. He is best known for his public buildings designed in the Beaux-Arts style. He was also involved in city planning.

John Crump (1827-1892):

Zoo Commissions: designed horse sheds, 1876; built "Gentlemen's Retiring Room designed by Collins & Autenrieth, 1874;

Crump came to Philadelphia from England at age twelve. In 1858 Philadelphia directory he was listed as a builder and in 1870 as an architect, carpenter, and hotel manager. He designed, owned, and operated the Colonnade Hotel.

Daget Saylor:

Zoo Commissions: animal hospital, 1996.

Frank Furness (1839-1912):

Zoo Commissions: elephant house (with Hewitt), 1875; restaurant, 1876; north gate house (with Hewitt), 1876; parrot house (with Hewitt), 1882.

Furness was born in Philadelphia. He worked under Richard Morris Hunt in New York City before returning to Philadelphia and establishing a business with George Hewitt with whom he worked until 1875. He is well-known for his Gothic Revival designs. In 1881, he joined with Allen Evans. He is recognized as one of Philadelphia's most important architects.

Harbeson, Hough Livingston & Larson:

Zoo commissions: zoo plan, 1956-1957; carnivore house, 1951; rare mammal house, 1965; reptile house, 1972.

Predecessors to Paul Cret's firm.

Hatfield, Martin and White:

Zoo commissions: bird house modernization, 1950; children's zoo, 1957; impala fountain base and pool, 1964; small mammal house, 1967; Wolf Woods, 1973.

Theodore White worked in the office of Paul Cret from 1925 to 1939.

George Hewitt (1841-1916):

Zoo commissions: deer house, 1875; elephant house (with Furness), 1875; north gate houses (with Furness), 1876.

Hewitt worked with John Notman from 1859 to 1865. From 1865 to 1875 he was in a partnership with Frank Furness. In 1878, he joined with his brother William D. Hewitt until his retirement in 1907. He designed several projects in Chestnut Hill including the Druim Moir mansion (1885-6), Wissahickon Inn (1884), and St. Martins in the Fields Episcopal Church (1888).

Kneedler, Mirick and Zantzinger:

Zoo commissions: Eleanor Grey Memorial Hummingbird exhibit, 1970.

**Meigs & Mellor: Arthur Ingersoll Meigs (1882-1956) and
Walter Mellor (1880-1940)**

Zoo commissions: bird house, 1916.

Both architects worked for Theophilus Chandler before creating their own firm in 1906. Most of their commissions were country residences designed in the Pennsylvania farmhouse and Norman farmhouse styles. George Howe was a partner in their firm from 1916 to 1928. Walter Mellor was a member of the zoological society.

Mirrick, Pearson, Ilvonen and Batcheler:

Zoo commissions: Education Center/Administration building, 1972; African Plains I & II, 1974 & 1975; Bear Country, 1980.

Hermann Joseph Schwarzm ann (1846-1891):

Zoo commissions: first plan, 1872.

Schwarzm ann was born in Munich, Germany. He attended the Royal Military School where he might have had some training in drafting and engineering. He emigrated in America in 1868 and a year later began working for the Fairmount Park Commission as "junior assistant engineer."

According to the architectural historian, Jeffrey Cohen, Schwarzm ann's duties included "surveying work, planning and supervising the execution of roads, paths, and bridges, ...laying out planting schemes, and...the design and alteration of buildings."¹¹⁵ In 1872, he was promoted to "Chief Engineer of Design." The Fairmount Park Commission accepted his design for the revised plan for the park over the famous team of Olmsted and Vaux. It also entrusted him with the design of the landscape and the significant buildings for the Centennial Exposition at approximately the same time that he received the zoo commission.

Schwarzm ann opened a private practice with George Pohl in 1876 and then another one with Hugo Kafka a year later. Soon after, he moved to New York City and began a practice with Albert Buchman. He died in 1881.

Ueland and Junker:

Zoo commissions: Impala Fountain Cafe, 1987.

Venturi, Rauch, and Scott Brown:

Zoo commissions: Treehouse (interior of deer house), 1985; World of Primates, 1986.

Robert Venturi and John Rauch began their partnership in 1964 and Denise Scott Brown joined the firm three years later. Rauch left the firm in 1988. Their buildings reflect the eclectic style of post modern architecture.

¹¹⁵ Jeffrey Cohen, draft for biographical essay on Schwarzm ann.

Horticulture¹¹⁶

Plants have always been an integral and essential part of the zoo landscape. Hundreds of trees, shrubs, and flowers are planted on the property every year. Initially, they were just used to decorate the grounds but as conceptions of zoo design changed, they became vital parts of the animal exhibits, too. In keeping with the park's goal of maintaining an educational milieu within a pleasing landscape, many plants are labelled with common name, botanical name, and region of origin. They also serve the utilitarian roles as shade over pathways and exhibits, and as visual barriers so that some semblance of privacy is maintained in a park full of people.

Consistent throughout the zoo's history is a desire to preserve old growth trees; however, they are often sacrificed to new building campaigns. The oldest surviving trees on the property are an English Elm, located near the green house that is believed to date from Penn's eighteenth century landscape, and a beech tree, located north of Solitude that might be the only survivor of a row of beeches planted to mark the border of Penn's property. Moreover, a ginkgo located near Impala Fountain; an American elm, outside the greenhouse; two yellowwood trees near Solitude; and a magnolia located at the south entrance to the rare mammal house are all thought to date from the nineteenth century.

There are three main phases of gardening design at the zoo. The first phase, 1874-1938, is characterized by the creation of a picturesque landscape. A great variety of exotic and native plants were grouped to create an interesting and variegated scene. Most specimens were planted to mimic a naturalistic setting, though formal flower gardens were attached to some buildings, such as the carnivore house and the north entrance gates. Although no written records survive of the types of plants used, early photographs and postcards of the zoo provide some indication of the varieties planted.¹¹⁷

During the first modernization period through the 1970s, the zoo's landscape was de-romanticized. Grass lawns replaced shrubbery around many exhibition areas, and the Picnic Grove and

¹¹⁶ For specific types of plants used in exhibit areas see Rose Ann Smarr, Horticulture Habitats & History: The Philadelphia Zoo (Philadelphia: Zoological Society of Philadelphia Docent Council, 1991)

¹¹⁷ I believe the early etchings and engravings are less reliable because they appear to exaggerate the lushness and wildness of the landscape for aesthetic reasons.

playground areas. However, fifteen hundred flowering fruit trees, donated by A.E. Wohert of Garden Nurseries in Narberth, Pennsylvania in 1933, planted at the north entrance, north side of small mammal house, and around the bird house and lake created colorful springtime arbors. Many of these trees are still thriving in the 1990s.

Two horticultural consultants, Ms. Idella Krause and Ms. Rena Middleton, were hired to tend to the zoo's flower beds in 1950. They planted a rose garden at the north entrance in 1950 and another one between the carnivore and pachyderm house ten years later. In 1959, the zoo received a Philadelphia Horticultural Society award for excellence for their designs. In 1971, the garden maintenance department including a curator of horticulture and a staff of gardeners was organized to tend the zoo grounds. Ironically, as the visitors areas became more domesticated, the animals' habitats assumed a much more naturalistic quality under Hagenbeckian influences.

The role of horticulture at the zoo adopted an expanded significance when plants became integral part of the animal exhibits. They were no longer simply judged by their aesthetic appeal but also for their serviceable attributes such as nutrition, toxicity, and durability. "Gardeners have recently become as indispensable to zoos as the animal keepers," noted one author.¹¹⁸ Members of newly formed Association of Zoo Horticulture work closely with zoologists to create viable, not just attractive, zoo landscapes.

Since the 1980s, a picturesque garden landscape has re-emerged on the zoo grounds. Guided by the new exhibit principles of habitat immersion and by a desire to recreate the nineteenth century-style park landscape, the gardening staff, under the supervision of landscape architects, has removed grass sod around exhibits and replaced it with a variety of shrubs and tall exotic grasses. Plant material from animal habitats is integrated outside exhibit areas along pathways and viewing sites in order to integrate visitors into the animals' realms. These exotic and lush groupings mimic nineteenth park design by creating isolated barriers in the park so that visitors feel as if they are viewing the animals in privacy. However, as larger and more complex exhibits are built, open spaces and vistas, which are also integral to a Victorian landscape, are lost. Nevertheless, a bit of wilderness has returned to the garden.

¹¹⁸ Roger B. Swain, "Better Zoos," World Monitor, August, 1989.

Sculpture

Since the nineteenth century, the Fairmount Park Art Association (incorporated in 1872) has provided the Zoo with sculpture as a part of their mission to "adorn Fairmount Park, in the city of Philadelphia, with statues, busts, and other works of art."¹¹⁹ During the twentieth century, sculptures have also been purchased by the Zoo, or donated by the city or private persons and corporations. One sculpture, Python, 1940, by Ben Schmucl, is a W.P.A. sponsored work.

The artistry of the sculpture compliments that of the buildings and the entire landscape design. In nineteenth century nomenclature, the sculptures also add civility to the rugged arcadian setting. In keeping with the motives of the park, nearly all of the works, whether realistic or abstract, are about wildlife. Like the buildings, the sculptures reiterate cultural perceptions of animals. Most express a very humanistic and sympathetic attitude towards their subjects. Some pieces, such as Hippo Mother and Baby by Henry Mitchell, are playful and others, such as Dying Lioness by Wilhelm Wolff, are quite dramatic.

The works are nearly as integral a part of the zoo landscape as the animal themselves. The arrival of Elephant and her Calf by Heinz Warneke in 1962 was greeted with as much fanfare as a new live specimen. Currently, several sculptures are marked as photo opportunities like a live exhibit.

The sculptures are more than just visual amusement. Many of them, such as Haddy by Dexter Jones, now located in front of the reptile house, are climbed on by children. Some figures were moved from other locations within Fairmount Park or from other sites within the zoo grounds. Fountains are also focal points in the zoo garden. They act both as visual features and resting places.

A list of current sculptures in the garden is provided below.

Africa, brass map of Africa with stainless steel animals, by Tom Allen, Jr., ca. 1973.

African Warthog, bronze, by Eric Berg, 1975.

Anteater, bronze, by Henry Mitchell, ca. 1966-1969.

Ape, granite, by Jacob Lipkin, 1969.

¹¹⁹ Fairmount Park Art Association charter as quoted in Fairmount Park HABS report.

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[Bald Eagle], copper-sheathed, one of a pair that stood on Bird House, the other was destroyed in a storm and so this one was removed and placed on the ground, artist unidentified, ca. 1916.

Bear and Her Cub, granite, by Joseph Greenberg, Jr., 1957.

Black Rhino, mixed-media, by Tom Dickson, 1985.

[Dolphins], three bronze dolphins, by Raymond Granville Barger.

The Dying Lioness, bronze, by Wilhelm Wolff, 1873.

Elephant and Her Calf, granite, by Heinz Warneke, 1962.

Felis leo and Felis tigris, two limestone bas reliefs on carnivore house, by Archer Lowrie, 1950.

Fishing Bear, bronze, by Evangelos Frudakis, 1980.

Giraffes, bronze, by Henry Mitchell, 1960.

[Gorilla], [Chimpanzee], and [Orangutan], three limestone bas reliefs on rare mammal house, by Joseph Greenberg, Jr., 1965.

Gorilla and Baby, plastic and fiberglass, The Sculpture Workshop, 1986.

[Bust of Eleanor Grey], bronze, Harry Rosin, 1970.

Haddy, bronze, by Dexter Jones, 1970.

Hippo Mother and Baby, bronze, by Henry Mitchell, 1957.

Hudson Bay Wolves Quarreling Over the Carcass of a Deer, bronze, by Edward Kemeys, 1872.

Impala Fountain, bronze, by Henry Mitchell, 1962-1963. Pool and fountain base by Hatfield, Martin & White.

Lemur, bronze, by Henry Mitchell, 1967.

Lioness Carrying To Her Young A Wild Boar, bronze, by Auguste Cain, 1886.

Massa, bronze, by Eric Berg, 1980.

My Jungle, wood relief, by Bernard Langlais, date unknown.

Nocturnus, nickel bronze relief representing nocturnal animals of the six major continents of the world, by Donald R. Miller, 1973.

[Otter], bronze, by A.J. Obard, Jr., 1992.

Penguins, bronze, by Albert Laessle, 1917.

Python, granite, by Ahron Ben-Shmuel, ca. 1940.

[Roaring Lion], (2), bronze, artist unknown. Recovered from the yard of a private residence, date unknown.

Toad, bronze, by Eric Berg, ca. 1986.

Unicorns were Dancing, bronze, by Henry Mitchell, 1969.

PART III. SOURCES OF INFORMATION

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Philadelphia Zoo archives and photograph library; Philadelphia, Pennsylvania.

D. Photographs (large collections):

Philadelphia Zoo photograph library: prints, photographs, and slides, 1874 to present.

E. Persons Interviewed:

Nina Bisbee, Director of Planning and Facilities, Zoological Society of Philadelphia; interview by author, Summer 1996.

Rod Haines, Curator of Horticulture, Zoological Society of Philadelphia; interview by author, Summer 1996.

F. Figures:

Figure 1: From Sidney and Adams, "Description of Plan for the Improvement of Fairmount Park," (Philadelphia: Merrihew & Thompson, 1859).

Figure 2: Plan for Spring Hill, ca. 1780s-1790s. Fairmount Park Commission Archives, Philadelphia, PA.

Figure 3: Topographical Map from The Second Annual Report of the Commissioners of Fairmount Park, (Philadelphia: King and Baird Printers, 1870).

Figure 4: "Plan of the Zoological Garden in Fairmount Park," (Philadelphia, 1872).

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Figure 5: Cover of Illustrated Guide and Handbook of the Zoological Garden of Philadelphia, 1875.

Figure 6: Proposed Plan of Zoological Garden, ca. 1872 from the First Annual Report of the Philadelphia Zoological Society of Philadelphia, (Philadelphia: 1875).

Figure 7: North gate houses. There was never actually a fence around the statue as depicted in this artistic rendering. Engraving from Second Annual Report, 1875.

Figure 8: North gate activity. Engraving from "The Philadelphia Zoo," Harpers Magazine, April, 1879.

Figure 9: Stream looking north to monkey house from bridge, ca. 1870s. Photograph by James Cremer, Library Company of Philadelphia.

Figure 10: Bridge looking north towards Solitude, winter, ca. 1870s. Postcard, Philadelphia Zoo Archives.

Figure 11: Bridge and path leading up to Solitude, ca. 1890s. Laserprint from slide, Philadelphia Zoo photograph library.

Figure 12: View of carnivore house and camel yard. ca. 1880s. (Present site approximately at intersection between lab and small mammal house.) Postcard, Philadelphia Zoo Archives.

Figure 13: Engraving of zoo buildings. African-inspired deer shelters in upper right corner. The Historical Society of Philadelphia.

Figure 14: Engraving of aviary by Theophilus Chandler. Second Annual Report, 1874.

Figure 15: Restaurant by Furness. From Fifth Annual Report, 1877.

Figure 16: Elephant house by Furness and Hewitt. From Fifth Annual Report, 1877.

Figure 17: Engraving of bear pits at Philadelphia Zoo, Second Annual Report, 1874.

Figure 18: Engraving of nineteenth-century bear pits in Berne, Switzerland zoo. New York Public Library Picture Collection.

Figure 19: View of Solitude and small animal cages, ca. 1875. Photograph by James Cremer. Library Company of Philadelphia.

Figure 20: Plan of interior of bird house by Mellor and Meigs,

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ZSP Collection, Philadelphia Athenaeum.

Figure 21: Elephant shows, ca. 1940. Philadelphia Collection, Prints and Photographs Division, Free Library of Philadelphia.

Figure 22: Stream west of beaver pond, 1934. Philadelphia Zoo photograph library.

Figure 23: Bird Valley, ca. 1950s. Philadelphia Zoo photograph library.

Figure 24: Children's Zoo, ca. 1974. From Zoological Society of Philadelphia Centennial Celebration.

Figure 25: African Plains I, 1970s. Philadelphia Zoo photograph library.

Appendix:

CHRONOLOGY

- 1785: Solitude, the house of John Penn, constructed.
- 1789: Penn returned to England.
- 1812: City purchases five acres of land for Fairmount Waterworks and creates a recreational area.
- 1826: London Zoo founded. Open to members and guest in 1828 and to the public in 1848.
- 1844: Lemon Hill purchased by city.
- 1853: West Philadelphia Waterworks begins operation.
- 1854: Act of Consolidation: Philadelphia expands to include west side of the Schuylkill and provisions made for increases in park land.
- 1859: Plan for the Improvement of Fairmount Park, 1859, notes the section of the park near Lemon Hill where the zoo will be located.
- The Pennsylvania Commonwealth votes to accept the incorporation of the zoo on March 21, 1859.
- 1867: Fairmount Park Commission formed.
- 1868: Park Act allowing for enlargement of Fairmount Park.
- 1872: Date of Schwarzmann plan.
- West Philadelphia Waterworks ceases operation.
- 1873: June 5, 1873 Fairmount Park Commission leases thirty-three acres in West Park to the zoological society.
- Schwarzmann designs plan for zoo and travels to Europe to study zoo architecture.
- July 31, 1873: William Camac, zoo president, asks Frank Thompson to be first superintendent at the zoo.
- Entrance lodge, propagating house for plants, enclosure for buffalo, and monkey house by Theophilus Chandler built. Bear pits and aviary under construction. Stream dammed and rustic bridges built across it.
- 1874: Aviary built. Designed by Theodore Chandler.

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March 19, 1874

Bear pits by T. Chandler completed May 1874.

Carnivore house by Collins and Autenrieth, northern part completed.

Wolves and foxes enclosures: four compartments with two double houses (48x24) June 15, 1874.

Contract for gate house at 35th Street entrance with Collins and Autenrieth. May 28, 1874.

Contract for restaurant with Theophilus Chandler. 10 June 1874.

Eagle aviary by Theophilus Chandler, skating house designed by Collins & Autenrieth (built Dec 10, 1874), prairie dog village, and steamboat wharf completed. Deer paddock extended and rustic house for buffalo and pens added. Three dams and pond made on creek.

Greenhouse erected.

Solitude library used as reptile and small mammal exhibit.

Contract for temporary restaurant and "Gentlemen's Retiring Room" designed by Collins and Autenrieth and built by John Crump. To be completed by 1 Feb 1875

100 cast iron seats placed around grounds.

Opening day, July 1, 1874. 10-11 acres enclosed with cedar picket fence for exhibition.

Secretary of Navy grants duty-free import of exotic animals on November 14, 1874

1875: Winter house for deer (renamed antelope house) by George Hewitt, builder Oliver Braddin. Contract October 18, 1875.

Lake: Contract signed Aug 12, 1874 to construct and excavate a lake by or before Nov 1, 1875.

Elephant house, contract April 8, 1875; completed December 1875. Designed by Furness & Hewitt.

James Cremer made zoo photographer from Jul 1, 1875 to Dec 31, 1876. His photo stand occupied the cigar

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stand.

1876: North entrance gate houses by Furness and Hewitt completed. Area graded and planted.

Restaurant by Furness completed.

Palm house for winter protection of tropical and ornamental plants, ponds for seals and otters, temporary reptile house, rabbit warren, and way-out gates at north end added.

October 28, 1876: Camac asks for ground between 35th Street and river for zoo.

1878: Slaughter house built.

1879: Begin elephant rides.

1881: Bathing pond for elephants and aviary on west walk between sea lion and south gate added.

Put in skylights in carnivore house.

1882: Rustic fence around deer park replaced by iron railing. Bark roof replaces thatched roof of deer houses.

New aviary by Furness and Hewitt opened March, 1882. Contains eighty-two cages. Also called the parrot house.

1883: Skating house torn down and site paved. To date, 655 deciduous trees, 860 evergreens, and 600 shrubs added to garden.

1886: Three bee hives placed at old photo stand.

1888: Aviary becomes reptile house.

Small mammals moved into old reptile house (used as store room between exhibits).

1891: City begins making annual grants to zoo: \$2000 in exchange for 10,000 student tickets. Used to make pheasant enclosures.

1893: Bear pen added near bear pits. Dug series of small ponds between lake and seal pond for "fancy waterfowl."

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- 1896: New monkey house by Theophilus Chandler built.
- 1897: Enclosure for elk added between carnivore house and east walk. Camels placed on opposite side of walk. Two iron cages for birds of prey added at south end.
- 1898: Monkey house converted into small mammal house.
Fire destroys interior of restaurant.
- 1899: William Camac, zoo's founder and first president, dies.
- 1900: Bird cages: suggest an increase in number but decrease in size.
- 1903: Surround a honey-locust tree with a fence to create habitat for raccoons.
- 1905: Penrose Laboratory completed.
Begin testing every monkey that enters garden for TB.
Extension of owl cages on crosswalk south of deer park.
Eagle aviary torn down but metal frame becomes cage for puma.
Zebra house erected south of antelope house.
Waterfowl enclosure at west end of lake created, includes ten pens with a stream running in between and a pond at each end.
- 1906: Carl Hagenbeck's Tierpark Zoo opens in Stellingen, near Hamburg.
- 1907: Building for flightless birds erected on west walk. Becomes kangaroo house.
- 1909: Adapt zebra house so visitors can enter it.
- 1911: Carriage shed at north gate changed to storage bin because no longer in use since public using cars.
Old music pavilion becomes outdoor cage for monkeys.
- 1912: Second floor added to lab.
Telephone system for all of garden replaced limited one.

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Increase outdoor cages.

1913: Extension of zoo grounds by eleven acres along east side.

Add outdoor runs for hippos and rhinos.

Monkeys with free access to the out-of-doors through swinging doors.

1915: Plan to abandon paddocks along creek and place deer along east side where there is new land available.

1916: Bird house by Mellor & Meigs opens October 4, 1916.

South entrance removed and put at new location on 34th Street. Walk laid.

1918: Deer enclosures along east walk completed.

125 Pine trees planted along east side.

1921: Pheasant enclosures erected.

1922: Addition to reptile house opens, doubles capacity.

Carriage shed torn down.

1923: Pens for foxes and wolves.

Alterations made at north gate house.

1924: Larger enclosures for antelope house.

New wing added onto north side of small mammal house.

New candy stand placed near monkey house.

1925: Row of cages on west walk added.

1926: New restrooms for men and women, and drinking fountains added at south end of garden.

Circular paddock at west walk torn down.

Zoo has exhibition at Sesquicentennial Exposition.

Purchase camels for rides.

1927: Flying cages for eagles and vultures completed.

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Old shelters at south end of lion house removed and hillside made into lawn.

1928: Zoo gets electricity.

Paul Cret commissioned to make a study of the garden and prepare a plan for future development.

100 benches set up on lawn near bird house for musical concerts in summer.

1929: Concrete floors added to elephant cages.

Walks outside north entrance replaced with cement.

1930: South gate house by Paul Cret and south parking lot added.

Reptile rock garden added.

1931: Add glass to Monkey House to prevent spread of TB from the public.

1933: Resolution to request funds from Federal Emergency Admin. for Public Works for improvements. Receive \$125,000 for creating new walks and relaying old ones, planting and grading, and adding moat to buffalo pens.

Restaurant renovated and leased to John Holland Co.

Gift of 1500 trees from A.E. Wohert of Garden Nurseries in Narberth, PA.

1934: Zebra house demolished.

Receive \$256,000 total from federal government for improvements.

1936: Model dairy barn erected.

Beaver pond dredged.

1938: Service building by Paul Cret erected.

Baby Pet Zoo opens May 1, 1938.

Picnic Grove created near dairy barn containing pavilion and playground.

Prairie dog village moved.

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Zoo takes over concessions June 1, 1938.

Old main restaurant torn down and business transferred to refreshment stand near monkey house.

- 1939: Monkey Island created.
- 1941: Elephant house by Paul Cret opened.
Old elephant house torn down.
- 1942: Six stone shelters built by WPA by service building.
- 1944: Baby Pet Zoo closed.
- 1947: City Council Ordinance passes March 14, 1947, authorizing loan(s) for city improvements including \$1,000,000 to the zoo for carnivore house, primate house, reptile house, small mammal house, and entry gates.
- 1948: Wing of reptile house modernized.
- 1950: Rose garden created between elephant house and carnivore house.
Bird house reopens after modernization by Hatfield, Martin & White.
- 1951: New carnivora house by Harbeson, Hough Livingston & Larson constructed. Contains thirty in-door and eighteen outdoor cages and two grottos.
New otter pool in front of antelope house built.
Greenhouse donated by Rudolph deSchauensee.
- 1954: Bird Valley opened (constructed between 1948-1954).
- 1956-1957: Eight-year zoo plan by Harbeson, Hough Livingston & Larson.
- 1957: Daniel W. Dietrich Memorial Children's zoo by Hatfield, Martin and White opened.
Beaver pond filled in and large shallow concrete basin for ducks built.
- 1962: Camel house erected northeast of Solitude.

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- 1963: Old carnivore house razed.
- 1964: Impala Fountain completed. Sculpture by Henry Mitchell and pool and fountain base by Hatfield, Martin & White.
- 1965: Rare mammal house by Harbeson, Hough Livingston & Larson opened.
- 1967: Small mammal house by Hatfield, Martin & White opened on site of old monkey house.
- 1969: Monorail opened.
- 1970: Bird house interior renovated. Eleanor S. Grey Memorial Hummingbird exhibit by Kneedler, Mirick & Zantzingers opens in back of the main bird house. Renamed Jungle Bird Walk.
- 1972: New reptile house by Harbeson, Hough Livingston & Larson opened on site of old one.
- Educational Center/Administrative building by Mirick, Pearson, Ilvonen, Batcheler opened. Dedicated to Freeman Shelly in 1982 who was zoo director from 1933 to 1966.
- 1973: Wolf Woods by Hatfield, Martin & White opened.
- New lease with Fairmount Park Commission signed September 24, 1973.
- 1974: African Plains, Phase I by Mirick Pearson, Ilvonen and Batcheler opened.
- First annual Zoobilee fund raiser.
- 1975: African Plains, Phase II
- Three small islands made from the rubble from the construction of African Plains and Bear Country added to bird lake.
- 1976: Solitude restoration project led by architect John Lloyd.
- 1978: Bear pits dismantled.
- 1980: New Master Plan by Bohlin, Powell, Larkin and Cywinski.
- Bear Country by Mirick Pearson Batcheler Henry opened.

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- 1982: ZooShop opens.
Waterfowl nursery erected.
- 1983: Penn's Woodland's Trail opened.
Monkey house demolished.
Animal commissary built.
- 1985: Antelope house converted to TreeHouse by Venturi, Rauch & Scott Brown.
- 1986: World of Primates by Venturi, Rauch & Scott Brown opened.
Kangaroo house becomes part of primate center.
Picnic Grove renovated by Caulk and Holms.
- 1987: Impala Fountain Cafe by Ueland and Junker built adjacent to rare mammal house.
Bird house renovations by Bohlin, Powell, Larkin and Cywinski.
- 1989: City of Philadelphia ceases annual subsidies to zoo.
- 1991: Carnivore kingdom by Bohlin, Cynzinski and Jackson with Coe, Lee, Robinson and Roesch opened.
- 1994: Porch added to pachyderm house. Design by Blackney and Hayes.

PART IV. PROJECT INFORMATION:

The documentation of the Philadelphia Zoological Gardens was undertaken by the Historic American Building Survey/Historic American Engineering Record (HABS/HAER) of the National Park Service, E. Blaine Cliver, Chief, during the summer of 1996 in cooperation with the Zoological Society of Philadelphia. The principals involved in the project from the Zoological Society of Philadelphia were Peter Hoskiss, Director; Nina Bisbee, Director of Planning and Facilities and Ginny , Veterinarian. For HABS, the principals involved were Paul D. Dolinsky, Chief, HABS; and Catherine C. Lavoie, HABS Historian, who served as project leader. The historical report was produced by Cynthia Ott. Large-format photography was produced by Jack E. Boucher.

PART V. Figure Pages:

Because the HABS/HAER Collection will be available on-line through the Library of Congress, copyright restrictions prohibit the use of the figure pages in this report. The illustrations were included initially as reference-only copies for the researcher and are noted in the Sources of Information section of this report. However, the potential ability of a person to download images with a computer alters the circumstances in which permission to use the images was granted to the author. The figure pages have been pulled and will be available as reference copies in the field notes attached to this record.